Oct. 27, 1942. E. S. SMITH 2,299,855

STATIC RING FOR LINEMEN'S GLOVES

Filed April 10, 1939 2 Sheets-Sheet 1

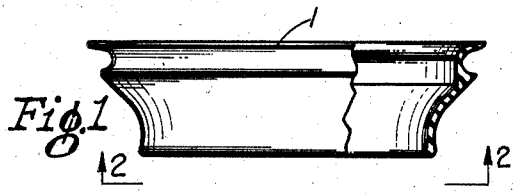


Fig. 1

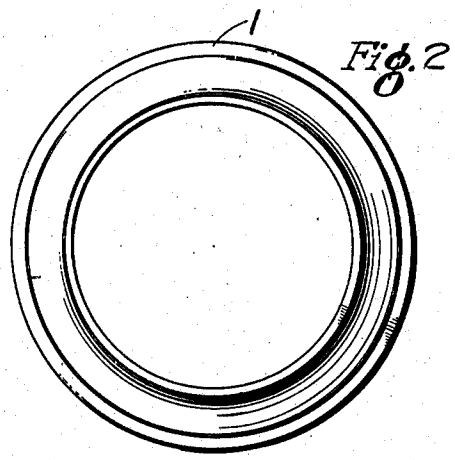


Fig. 2

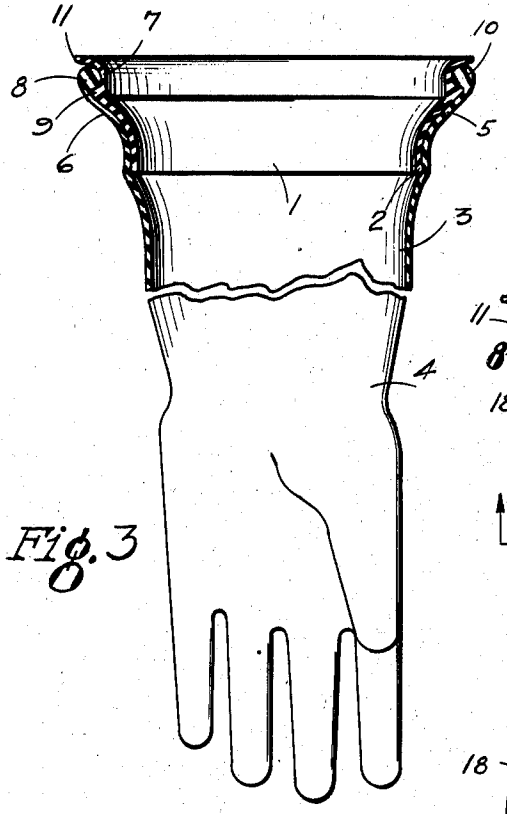


Fig. 3

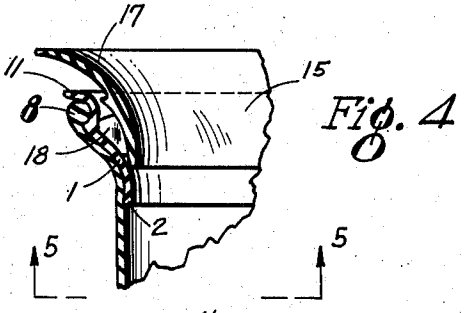


Fig. 4

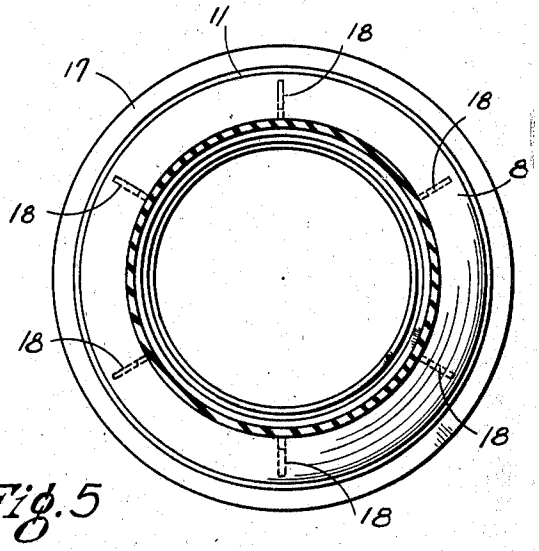


Fig. 5

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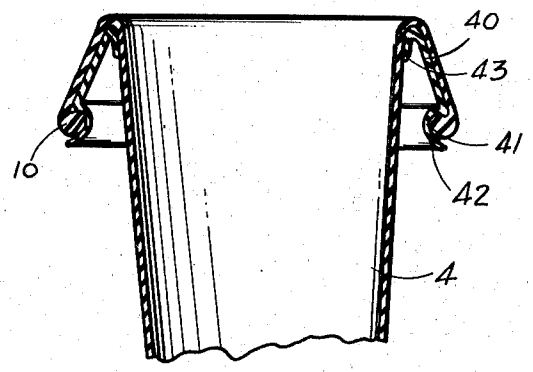


Fig. 6

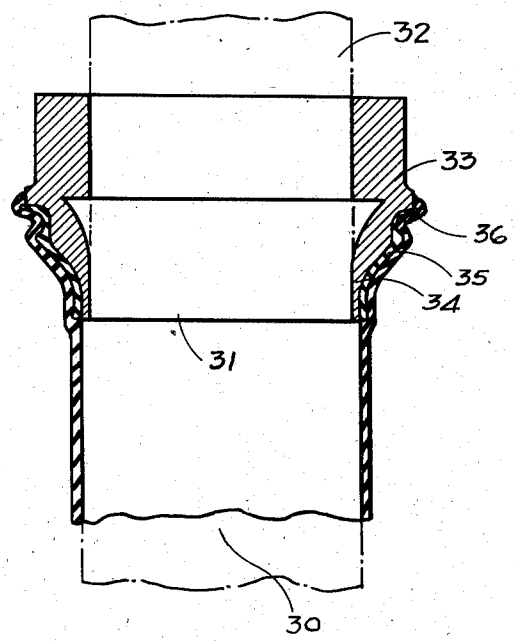


Fig. 7

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UNITED STATES PATENT OFFICE

2,299,855

STATIC RING FOR LINEMEN'S GLOVES

Emerson Sterling Smith, Ravenna, Ohio

Application April 10, 1939, Serial No. 267,149

16 Claims. (Cl. 2—168)

This invention relates to improvements in devices for controlling static electricity, and more particularly to a means for preventing the passage of static from linemen's gloves to the arms or clothing of the linemen.

It is well known that linemen who are working on live power lines have considerable trouble with static electricity. It is the usual practice for linemen to wear a pair of rubber gloves having a high dielectric strength to protect his hands. These gloves are provided with a relatively long cuff which extends up over the forearm of the wearer. Although the rubber glove affords considerable protection against the direct contact with the high tension wires, it has been found that due to the fact that the lineman is in contact with the wires for some considerable time, under certain atmospheric conditions, particularly when the humidity is high, a charge of static electricity forms on the surface of the glove which gradually creeps along the glove from the fingers upward toward the cuff and eventually accumulates to such an extent on the cuff that a discharge may occur from the cuff to the clothing or arm of the workman. This accumulation is decidedly dangerous, not from the aspect of the voltage itself particularly, but from the effect of the discharge on the reflexes of the workman. The discharge may occur with sufficient force to cause considerable shock, this shock being sudden and at a time when the workman may possibly not be prepared for it, may cause him to jerk his arm, which is very apt to cause his arm to come in direct contact with other wires of high voltage.

Although rubber gloves with cuffs supposedly arranged to prevent this current have been heretofore known, they have not been very effective because of the inherent flexibility of the rubber and the difficulty of maintaining sufficient dielectric between the path of the electrical charge and the wearer. By the present invention I have provided a means which can be used in conjunction with any of the standard and well known types of electric gloves, which in a large measure eliminates the defects present in the prior art device, and provides greater insurance against the accidental discharge of static to the user.

Still other objects of the invention and the invention itself will become more apparent from the following description of some embodiments thereof, which description is illustrated by the accompanying drawings and wherein:

Fig. 1 is an elevational view of my invention, a portion thereof being broken away and shown in section;

Fig. 2 is a bottom plan view looking from a plane as shown by the arrows 2—2 of Fig. 1;

Fig. 3 is a vertical medial sectional view of the invention showing the cuff of a glove attached thereto, the hand portion of the glove being shown in elevation;

Fig. 4 is a fragmentary section of a modified form of the invention;

Fig. 5 is a bottom plan view of the device of Fig. 4 taken on the line 5—5 of Fig. 4 looking in the direction of the arrows and showing the glove in cross section;

Fig. 6 is an elevational view with a part broken away and shown in section of another modification of the invention and showing the position taken by the rubber glove; and

Fig. 7 is a fragmentary vertical medial section showing a method of fabricating a glove with the device of my invention built in.

Throughout the drawings, like parts have been designated by like reference characters.

Generally speaking, the device of my invention comprises a ring-shaped member adapted to have the cuff of the glove stretched over it and having a restricted portion for contact with the arms or clothing and an outwardly extending portion which extends away from the wearer and provides an effective dam for the flow of static electricity.

More particularly, as best shown in Figs. 1 to 3, the device may comprise a circular member adapted to be inserted in the cuff of the glove and including a lower wall portion 1 which is of flared formation, the sides converging to their smallest diameter at the end 2 which is inserted into the cuff 3 of the glove 4. Conversely the wall flares outwardly toward the edge of the cuff as at 5, the flared portion terminating at 6 to provide a generally cylindrical body 7. The body is provided with a circumferential groove 8 in its periphery, the groove being separated from the portion 1 by a bead 9 and adapted to receive the rolled bead 10 formed on the edge of the glove cuff. The cylindrical wall extends upwardly from the glove and terminates in an outwardly extending circumferential flange 11. The flange 11 extends beyond the periphery of the bead 10 and away from the body of the wearer.

The device is of a sufficiently larger diameter than the cuff to require the cuff to be stretched for engagement therewith. It is inserted into the cuff of the glove with the bead of the glove cuff disposed in the groove 8. The glove cuff being

smaller than the ring, is stretched tightly over the body 5 following closely the contour thereof.

The ring is molded or formed of a semi-plastic material of which there are many well-known in the industry today such as pyroxylin, Bakelite, Celluloid, or the like, the only requisite being that the material have good dielectric qualities and be resistant to the passage of electricity over the surface. It will be seen from the foregoing description, that this device makes it necessary to have only one set of rings for each lineman, although they may each have several pairs of gloves. The rings can be removed from the gloves and cleaned thoroughly with materials that might otherwise be deleterious to the glove and cause disintegration.

In operation the glove with the device attached is used in the usual manner which usually comprises inserting the hand and forearm into the glove with the fingers in the fingers of the glove, as is common practice. If additional fabric gloves are desirable they may be worn over the outside in the usual manner or also on the inside as is sometimes the custom.

The smallest diameter of the ring which is indicated at 2 is sufficiently large to allow the clothing of the workman to extend therethrough, but is also small enough so that there is not undue clearance between the ring and the clothing, the device engaging the clothing of the workman at the point of the smallest diameter. This has a tendency somewhat to restrict the billowing of the wearer's sleeves at this point. Inasmuch as the general conformation is outwardly flaring toward the edge of the glove, the cuff of the glove is not only held out of contact with the clothing or arm of the wearer, but is held away from the arm to a material extent. Furthermore, although there may be a tendency for atmospheric moisture to accumulate on the surface of the glove, thus in some instances providing a better passage for current over the surface, the material of the device which flares outwardly at the flange 11, provides an efficient electrostatic dam, materially decreasing the possibility of electricity creeping across the surface. Furthermore, because it is of an outwardly flaring nature and because the clothing is somewhat compressed at the part 2 on the lower part of the ring, there is considerable distance of travel necessary over the surface before the electricity may reach the clothing.

Inasmuch as the member flares outwardly throughout its length, it also tends to divert water, which may accumulate on the glove, from creeping to the interior of the cuff.

In Figs. 4 and 5 I have shown another modification of the device where an inner ring similar to that of Fig. 1 is used and an inner ring indicated generally at 15 is provided. In this device the outer ring provides additional protection against the contact of the gloves with the device; permits air to circulate more freely into the interior of the glove; provides further effective means for the elimination of water; and also definitely increases the dielectric path over which electricity must travel before reaching the clothing or arm of the user. The inner ring comprises a flared body, the lower end being of smaller diameter than that of the ring 1, as indicated at 2 in the ring 1, and the outer edge 17 being of larger diameter, all as best shown in Fig. 4. The two members are connected in spaced relation to each other by a plurality of radially disposed members 18 formed integral therewith. As best shown in Fig. 5, I have provided six of such spacers, but obviously the number of spacers is not of the essence of the invention. The spacers 18 also permit circulation of the atmosphere from the exterior of the ring 15 and the interior of the ring 1. The flange 17 in this instance extends materially beyond the exterior of the flange 11. I have also provided a channel member around the exterior of the member 17 on the underside thereof, the purpose of which is to collect water and prevent the same from flowing downwardly through the air spaces into the glove.

The ring 1 may be of slightly larger diameter than that shown in Figs. 1 to 3 inclusive, to maintain the portion 16 of the auxiliary ring sufficiently large to permit easy access of the arm. The dielectric path is increased substantially since the clothing has substantially no contact with the inner surface of the ring 1, it being held away therefrom by the ring 17. This thus affords the entire inner surface of the ring 1 as a dielectric path over which the electricity must travel before reaching the clothing. Furthermore, the ring 17 extending radially beyond the periphery of the ring 11 provides this additional protection against contact.

In Fig. 6 I have shown another modification of the invention where the cuff is adapted to be turned back upon itself. The ring in this instance comprises a frustro-conical body 40 provided at its lower edge with a circumferential groove 41 adapted to receive the bead 10 of the glove 4. An outwardly flared flange portion 42 is provided below the bead. The upper end of the ring is provided with a curved portion 43 which extends downward inside of the ring. As shown in the drawings, the glove is inserted through the ring and the cuff stretched over the outer surface with the bead 10 disposed in the groove 41. Any electricity which tends to accumulate on the glove surfaces has to travel over the entire inner surface of the ring as well as the cuff of the glove before it can reach the arm of the wearer.

In Fig. 7 I have illustrated a form 30 which may be substantially the same as any other glove form used in manufacturing the glove where a form is dipped into latex or similar material to provide the desired contour. In this instance, the form is provided with a shoulder 31 and a reduced portion 32 upon which a member 33 is disposed, which member is provided with an inwardly flared portion 34 abutting the shoulder 31 and adapted to receive a ring 35 formed generally as the ring shown in Fig. 1. The outer surface of the form 33 provides intimate contact with the ring from the bottom to the upper part, the purpose of which is to permit the rubber to be flared around the ring and over the edge of the flange 36. In manufacturing the gloves, the form with the ring 35 is carried by the form and the dipping process consummated in the usual manner, the rubber which is to form the cuff of the glove covers the entire surface of the ring except that in contact with the member 33. Thus the ring is molded or fabricated into the glove.

Although I have, throughout the specification, recited the gloves as being made of rubber, it should be understood that I am not limiting the invention to a glove made out of rubber, but that the glove may also be made of any suitable

flexible dielectric material of which there are several on the market and usually known as synthetic rubbers.

Having thus described my invention, I am aware that numerous and extensive departures will be apparent to those versed in the art and I therefore do not desire the invention to be limited otherwise than is expressed in the appended claims.

I claim:

1. In combination with a lineman's rubber glove, a static suppressor comprising a stiff ring-shaped body member of dielectric material over which the cuff of the glove may be stretched and held into operative engagement with the glove by the tension of the rubber, a flared flange on said ring extending outwardly from the glove and furnishing an obstruction to the travel of electricity.

2. A device of the class described, a ring-shaped body member of relatively stiff dielectric material arranged to permit free passage of an arm therethrough and adapted to be attached to the cuff of a glove, and an outwardly flared portion on said ring formed to extend away from the users arm and providing a dielectric obstruction preventing the passage of electricity from the body of the glove to the wearer.

3. In combination with a lineman's glove having a cuff thereon, means to hold the cuff in a predetermined position and oppose the passage of electricity from the glove to the workman, comprising a ring of stiff dielectric material having a body portion for receiving and holding the cuff and a flared flange portion extending beyond the cuff and away from the axis of the ring.

4. A device of the class described, a lineman's rubber glove, a cuff therefor, a bead on the end of said cuff, a ring of dielectric material having an inwardly reduced portion adapted to be inserted inside of said cuff and an opening therethrough to permit free insertion of the user's arm, said ring being formed with an annular groove in its periphery and said glove bead adapted to be seated in said groove to retain the ring in the cuff.

5. A device of the class described comprising a body of generally circular form to be inserted in a resilient cuff, a groove formed in the surface to receive the bead of the cuff, said body flaring outwardly toward the edge of the cuff and being of a diameter at its smallest part to provide free clearance for the workman's arm, a part extending from said ring beyond the cuff and providing a dielectric path extending away from the wearer's arm and increasing the distance electricity must travel in order to reach the wearer's arm.

6. A device of the class described comprising a body of generally circular form to be inserted in a resilient cuff, a groove formed in the surface to receive the bead of the cuff, said body flaring outwardly toward the edge of the cuff and being of a diameter at its smallest part to provide free clearance for the workman's arm, an outwardly flared portion having an insulated connection with said body, extending away from the wearer's arm to increase the distance electricity must travel from the surface of the glove to reach the wearer's arm.

7. A device of the class described, a lineman's rubber glove, a cuff therefor, a ring of dielectric material having an inwardly flared portion adapted to be inserted inside of said cuff and an opening therethrough to permit free insertion of the user's arm and providing a dielectric obstruc- seated on said ring, an outwardly flared flange on said ring extending beyond the cuff of the glove and away from the wearer's arm and forming an obstruction for the passage of electricity from the surface of the glove to the wearer.

8. In combination with a lineman's glove having a cuff thereon, said cuff having a bead at its extremity, means to hold said cuff out of engagement with a wearer's arm and to provide a zone resistant to the passage of electricity from the glove surface to the arm comprising a body of dielectric material having a curved inwardly converging wall provided with an enlarged bead at its one extremity and an annular flange at the other end of said wall, the wall of said member beyond the flange provided with a groove for the reception of the bead on the end of said cuff and an outwardly curved flange beyond said groove to furnish a path resistant to the path of electricity extending beyond the cuff and away from the wearer's arm.

9. In combination with a lineman's glove of flexible electrical resistant material having a cuff, the extremity of which is beaded, means for said cuff to hold the cuff in a predetermined formation and oppose the passage of electricity from the glove to the body of the wearer comprising a ring of stiff dielectric material, a body portion for said ring comprising an inwardly reduced flange for insertion in the cuff, a groove formed in the surface of the ring at the end of said flange to receive the bead of the cuff, an outwardly flaring flange extending from said grooved portion beyond the glove cuff and away from the axis of the ring, said first flange having an inner diameter sufficient to allow free passage of the wearer's arm but to restrain the billowing of the wearer's clothing, said second flange flaring away from the clothing and adapted to be held out of contact therewith by the first flange.

10. A static device for use in conjunction with linemen's gloves comprising a ring of relatively stiff dielectric material having an outwardly flared surface and adapted to receive the glove through the ring and said outwardly flared surface formed to hold the cuff of the glove away from the clothes of the wearer.

11. A static device for use in conjunction with linemen's gloves comprising a ring of dielectric material, the outer surface of said ring being outwardly flared and having a groove in its periphery at the edge thereof, said glove adapted to extend through the ring and have the cuff folded back over the flared surface with the bead of the cuff disposed in the groove.

12. In combination with a lineman's glove having a cuff with a bead at the end of the cuff, a static ring for holding the cuff in a predetermined formation and comprising a body having an outer frustro-conical surface, an inwardly turned flange at the small end of said body, the other end of said body being formed to provide an annular groove and a flange extending outwardly from said groove and terminating said body, said glove adapted to have the cuff extended through the ring and stretched over said inwardly turned flange and said frustro-conical surface with the bead seated in said groove, said inner surface of said ring between the inturned flange and the underside of said body out of contact with the cuff providing a surface resistance to the passage of electricity and adapted to prevent the passage of water from the glove to the wearer.

13. In combination with a lineman's insulating glove, a member of dielectric material for dis-

tending the cuff and preventing contact of the cuff with the wearer's arm, a dielectric flange extending beyond the edge of the glove and away from the wearer's body, a second dielectric member supported by said first member and extending beyond said first member and farther away from the wearer's body adapted to prevent contact of the wearer's arm or clothing with the first member.

14. In combination with a lineman's insulating glove, a dielectric ring for distending the cuff and preventing contact of the cuff with the wearer's arm, said ring including a dielectric flange extending beyond the edge of the glove and away from the wearer's body, a second dielectric member connected to said first member in spaced relation thereto and extending beyond said first member and farther away from the wearer's body adapted to prevent contact of the wearer's arm or clothing with the first ring and to permit free circulation of air between the rings to the wearer's arm.

15. In combination with a lineman's glove having the properties of protecting the wearer against shock, a cuff therefor, a dielectric ring arranged to have the cuff stretched thereover and to hold said cuff away from the wearer's arm, an extension of said ring comprising an outwardly flared portion furnishing a dielectric path extending away from the wearer and a second ring having a portion extending into and means for supporting said second ring by said first ring, an outwardly flared flange extending beyond said first ring to provide additional protection and hold the wearer's arm and clothing away from contact with the first ring, said support between the rings permitting air to circulate therebetween.

16. In combination with a lineman's glove of flexible dielectric material having a cuff, a static ring for holding the cuff away from the wearer's clothing and adapted to oppose the passage of electricity over its surface comprising a pair of spaced concentric rings, said outer ring adapted to be received by the glove cuff and hold the same in predetermined formation, said inner ring adapted to engage the clothing of the wearer and hold it out of contact with the outer ring and having an outwardly flared portion extending beyond the confines of the outer ring and a projection extending around the surface of the inner ring between the inner and outer ring to receive and deflect water entering between said rings.

EMERSON STERLING SMITH.

CERTIFICATE OF CORRECTION.

Patent No. 2,299,855. October 27, 1942.

EMERSON STERLING SMITH.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 3, first column, line 74, claim 7, strike out "and providing a dielectric obstruc-" and insert instead --, said glove cuff adapted to be--; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 22nd day of December, A. D. 1942.

(Seal)

Henry Van Arsdale,
Acting Commissioner of Patents.