

April 30, 1968

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3,381,173

STATIC-ELIMINATING OVERSHOE

Filed Jan. 26, 1965

3 Sheets-Sheet 1

FIG. 1.

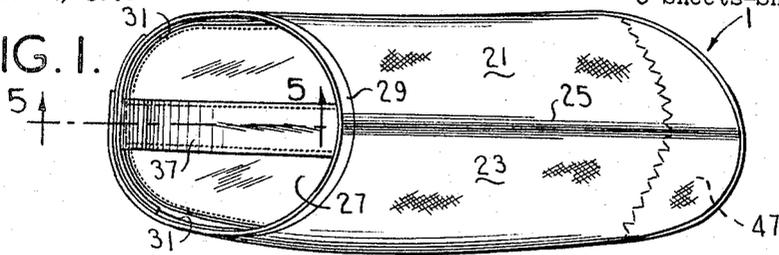


FIG. 5.

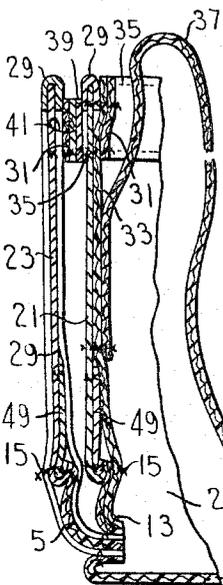


FIG. 2.

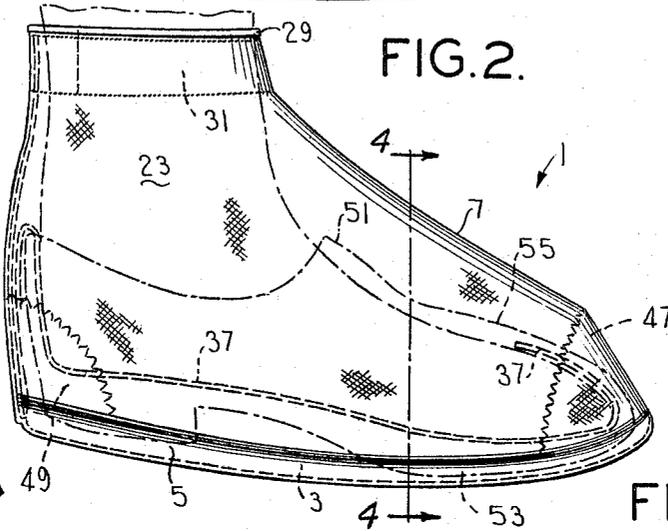


FIG. 6.



FIG. 4.

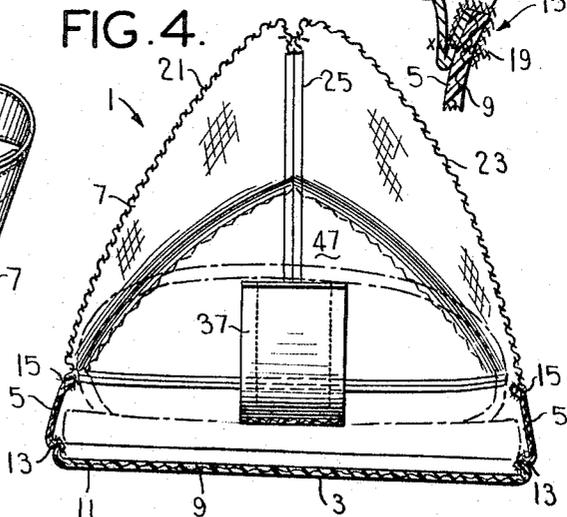


FIG. 3.

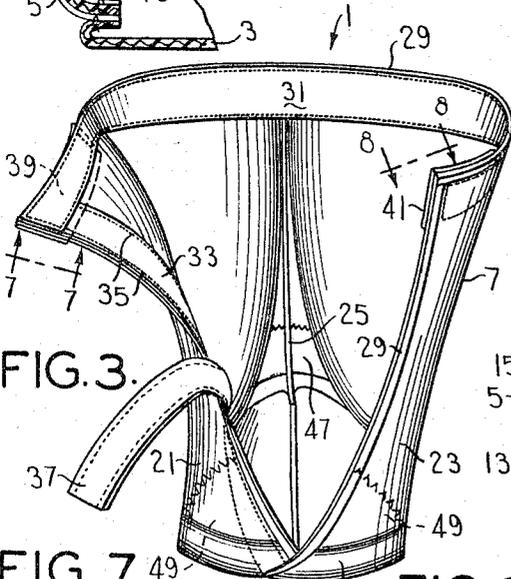


FIG. 7.

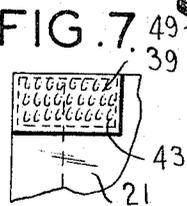
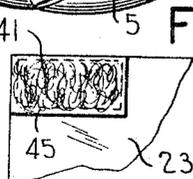


FIG. 8.



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FIG. 9.

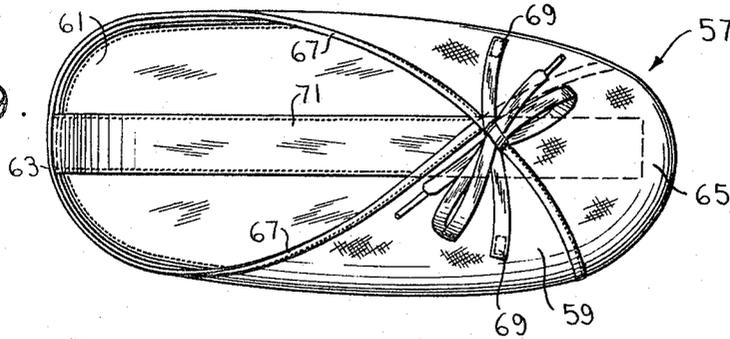


FIG. 10.

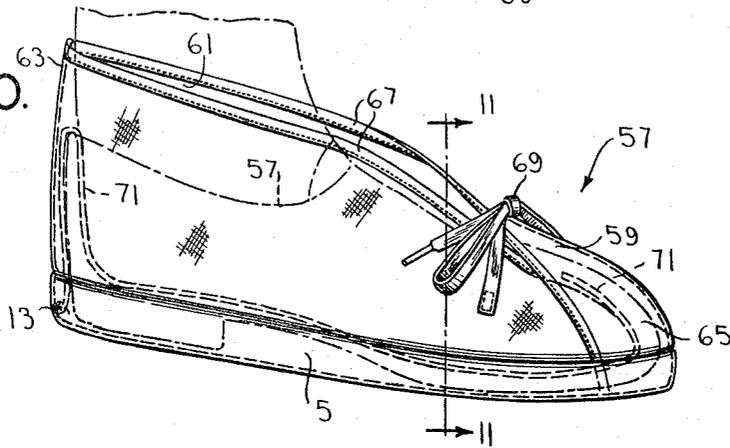
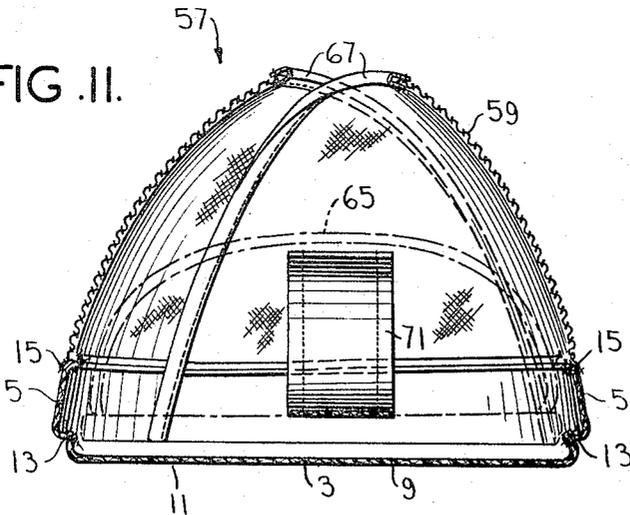


FIG. II.



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FIG. 12.

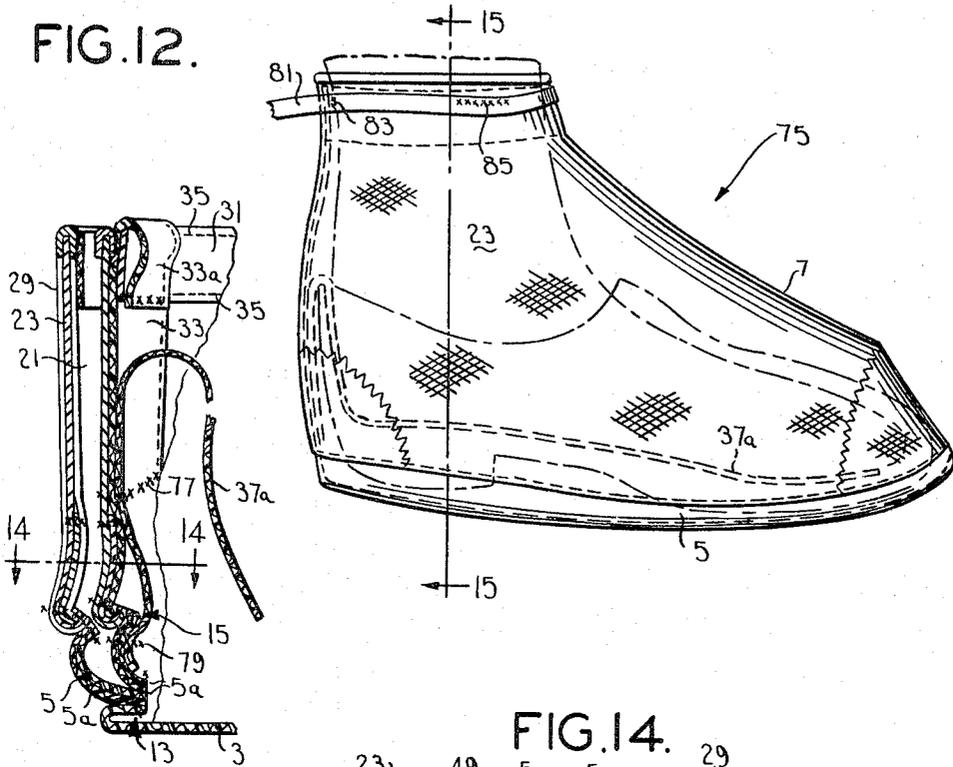


FIG. 13.

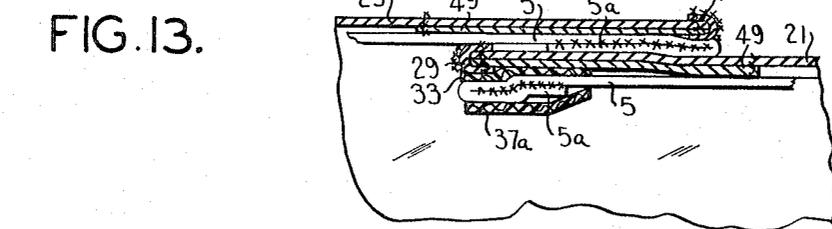
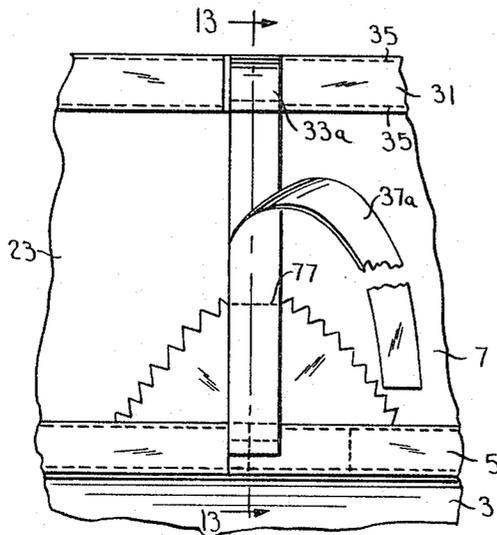


FIG. 14.

FIG. 15.



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**STATIC-ELIMINATING OVERSHOE**

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Continuation-in-part of application Ser. No. 363,933,  
Apr. 30, 1964. This application Jan. 26, 1965, Ser.  
No. 432,057

5 Claims. (Cl. 317-2)

**ABSTRACT OF THE DISCLOSURE**

A static-eliminating overshoe for use in operating rooms over street shoes has a sole of an abrasion-resistant electrically conductive elastomeric sheet material, a welt of an abrasion-resistant flexible material extending around the periphery of the sole and stitched at its lower margin to the periphery of the sole, and a cloth upper stitched at its lower margin to the upper margin of the welt. A strap of electrically conductive elastomeric material connected to the sole is adapted to be placed inside a street shoe when the overshoe is worn, and conducts static electricity from the wearer's foot to the sole and grounds it to the floor.

This application is a continuation-in-part of my co-pending patent application Ser. No. 363,933, filed Apr. 30, 1964, now abandoned, entitled, Overshoe. This invention relates to overshoes, and more particularly to static-eliminating overshoes for use by surgeons and other personnel in operating rooms.

It will be understood that it is of utmost importance to eliminate static electricity in operating rooms to avoid fire hazard. The floor of an operating room conventionally is a tile floor as to which the tiles are electrically conductive, and personnel in the operating room wear boots with soles of electrically conductive material for conducting static electricity away from the body to the floor.

Among the several objects of this invention may be noted the provision of improved overshoes for the purposes described which are adapted to be worn over street shoes, and which are so constructed as to have a reasonably tight fit, as distinguished from a loose annoying fit, over the street shoes; the provision of overshoes such as described which may be readily put on over street shoes and taken off; the provision of overshoes such as described which are resistant to wear; the provision of overshoes such as described which are resistant to stain and which may be laundered and sterilized; and the provision of overshoes such as described which are economical to manufacture. Other objects and features will be in part apparent and in part pointed out hereinafter.

The invention accordingly comprises the constructions hereinafter described, the scope of the invention being indicated in the following claims.

In the accompanying drawings, in which several of various possible embodiments of the invention are illustrated:

FIG. 1 is a plan view of an overshoe of this invention;  
FIG. 2 is a side elevation of the overshoe of FIG. 1;  
FIG. 3 is a view of the rear of the overshoe of FIG. 1 with the heel portion opened;

FIG. 4 is a cross section taken on line 4-4 of FIG. 2;  
FIG. 5 is an enlarged cross section taken on line 5-5 of FIG. 1;

FIG. 6 is an enlarged cross section through the seam connecting the welt and the fabric upper of the overshoe;

FIG. 7 is an enlarged fragmentary view taken on line

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7-7 of FIG. 3 and showing a portion of the fastener material on the overshoe.

FIG. 8 is an enlarged fragmentary view taken on line 8-8 of FIG. 3 and showing the other portion of the fastener material;

FIG. 9 is a plan view of another overshoe of this invention;

FIG. 10 is a side elevation of the overshoe of FIG. 9; FIG. 11 is a cross section taken along the line 11-11 of FIG. 10;

FIG. 12 is a side elevation of another overshoe of this invention;

FIG. 13 is an enlarged vertical cross section taken on line 13-13 of FIG. 15;

FIG. 14 is a horizontal cross section taken on line 14-14 of FIG. 13; and

FIG. 15 is an inside elevation of the heel portion of the overshoe of FIGS. 12-14 taken on line 15-15 of FIG. 12.

Corresponding reference characters indicate corresponding parts throughout the several views of the drawings.

Referring to the drawings, an overshoe of this invention, adapted to be worn over a street shoe, is designated in its entirety by the reference numeral 1. As shown, the overshoe comprises a sole 3, a flexible welt 5 attached to the sole 3, and an upper 7 attached to the welt.

The sole 3 is made from abrasion-resistant electrically conductive elastomeric sheet material, comprising, for example, a core of nylon fabric 9 covered or impregnated with a conductive Neoprene material 11 containing carbon black. The sole material has a high stain resistance which is desirable for hospital use since the shoes must be cleaned and sterilized after each use in the operating room.

The welt 5 may be made of the same or similar material as that used for the sole 3. If desired, the welt can be made of a stretchable or elastic material to insure a good fit on the street shoes. The lower margin of the welt 5 is secured to the sole 3 by an inturned stitched seam 13 which join edges of the welt 5 and sole 3 in outside-face-outside-to-face relation. The seam 13 is at the side of the overshoe as shown in FIG. 4. This manner of connecting the welt 5 to the sole 3 protects the seam 13 from floor abrasion and thus reduces the possibility of tears or separation between the welt and the sole. The provision of the welt 5 and the manner in which it is attached to the sole 3 provides a measure of strain resistance to the overshoe 1.

The lower margin of the cloth upper 7 is stitched to the upper margin of welt 5 by a seam 15. As shown in FIG. 6, the welt 5 and upper 7 are secured in outside-face-to-outside-face relation by a line of overcast stitching 17 so that the seam or overcast stitching is at the inside of the overshoe 1. The lower margin of the cloth upper 7 is then turned up against the line of overcast stitching 17 and a second line of stitching 19 is driven through the upturned portion of the upper and through the line of overcast stitching 17.

The upper 7 of the overshoe 1 is made of two similar sections 21 and 23 which are the mirror image of each other, these sections 21 and 23 being secured together in outside-face-to-outside-face relation by a line of overcast stitching forming a seam 25. Seam 25 extends from the toe to the top of the overshoe. The overshoe 1 has a leg opening 27 around the top margin of the upper 7 and a binding 29 is sewn to the upper margin of the upper 7 around the leg opening. The upper 7 is split through the heel portion of the overshoe from the leg opening 27 to sole 3 and the binding 29 extends along

the margins of the sections 21 and 23 defining the split or open rear portion of the overshoe. As best illustrated in FIGS. 3 and 5, the section 23 of the upper 7 overlaps the section 21 at the split or open rear portion of the overshoe. Portions of the welt 5 also overlap in the heel and are caught in the seam 13 connecting the welt 5 to the sole 3.

A strip of electrically conductive material 31 is sewn to the inner face of the upper 7 around the leg opening 27. Another strip of electrically conductive material 33 is secured to the inner surface of section 21 of the upper 7 along the margin of the split or opening at the back of the overshoe and an end of the strip of material 33 is positioned beneath an end of the strip 31. The other end of the strip of material 33 is connected to welt 5 and is caught under seam 13 which connects the welt 5 to the sole 3. The strips of material 31 and 33 are secured to the upper 7 and welt 5 by lines of stitching 35. Strips 31, 33 provide means for conduction of static electricity from the strip 31 to the welt 5 and to the sole 3 of the overshoe.

A strap 37 of electrically conductive material has one end thereof secured to the strip of material 33. The intermediate and other end portions of strap 37 are free and positionable inside a street shoe when located inside the overshoe as explained hereinafter. Strap 37 and strips 31, 33 of conductive material can be made from the same type of material used in the sole and welt of the overshoe.

Lengths of cooperable fabric fastener material 39 and 41 shown in FIGS. 3, 5, 7 and 8 are used to close the split or open back of the overshoe. The length of fastener material 39 is sewn to the outer surface of the upper margin of the section 21 of the upper 7. The fabric fastener 39 has a multiplicity of hook-like pile elements 43, FIG. 7, which project outwardly away from the section 21. The other length 41 of the fastener material is sewn to the inner surface of section 23 of the upper 7 and has a loop pile surface 45 facing inwardly for interengagement with the hook-like pile elements 43. The lengths of fastener material 39, 41 are connected together by placing them in overlapping relation and pressing the pile surfaces 43, 45 together, and the lengths of material 39, 41 may be separated by pulling either of the lengths of material away from the other length of material. The lengths of fastener material 39 and 41 are available commercially under the trade mark Velcro and are similar to the material shown in De Mestral U.S. Patent 2,717,437, issued Sept. 13, 1955.

The fabric upper 7 is shown as a one-ply fabric and the heel and toe portions of the upper can be reinforced by pieces of reinforcing fabric 47 and 49 sewn to the toe and heel of the shoe. The pieces of reinforcing fabric 49 in the heel are located between the strip of conductive material 33 and the sections 21, 23 of the upper 7 as best illustrated in FIG. 5.

In using the overshoe 1, a street shoe 51 is placed within the overshoe 1 with the sole 53 of the street shoe resting on the inner surface of the sole 3 of the overshoe, and with the upper 55 of the street shoe being positioned within and beneath the upper 7 of the overshoe. The strap 37 is then placed within the street shoe 51 and extends along the inside of the sole 53 of the street shoe into the toe portion of the street shoe. The free end of strap 37 can be turned around the toe of the foot when the foot is inserted into the street shoe. The strap 37 is thus in contact with a substantial portion of the foot of the user or the stocking worn on the foot. With the foot in the street shoe 51, the sections 21 and 23 of the upper 7 are overlapped at the split or open back and overlapping portions of the fabric fastener material 39 and 41 are pressed into engagement with each other to thereby hold the sections of the upper together and substantially close the heel of the overshoe. The leg opening 27 is pulled tightly against the leg so that the strip of conductive material 31 around the top of the upper 7 snugly engages the leg.

With the overshoe 1 thus fastened in place on the street shoe 51, the leg and foot (or stocking) are in contact with the strip 31 and strap 37 of conductive materials and these members in turn are connected through the strip 33 of conductive material and the welt 5 to the sole 3. As a result, static electricity in the body is grounded, particularly when standing on tile floors in operating rooms which are electrically conductive, thereby readily conducting static electricity away from the body to the floor.

Another overshoe of this invention is illustrated in FIGS. 9-11 of the drawings and is designated in its entirety by the numeral 57. The overshoe 57 has a one-piece cloth upper 59. Upper 59 has a leg opening 61 at the top thereof and an integral heel portion 63. The toe 65 of overshoe 57 is formed by overlapping portions of the cloth upper 59 and the welt 5 to provide a double thickness of material at the toe and thereby reinforce the toe. A binding 67 is sewn to the upper edge of the cloth uppers 59 around the leg opening 61 and along the edges of the upper to the welt 5.

An end portion of laces 69 are sewn to the uppers 59 adjacent the leg opening 61 and the overlapping portions of the upper. The laces 69 are pulled tightly and tied in a conventional manner to hold the overshoe 57 on a street shoe. Laces such as indicated at 69 can be used for fastening the sections of the upper of the overshoe 1 and two laces can be fastened as shown in FIGS. 9-11 or a single lace can be provided and connected adjacent the top of the upper 7 and wrapped around the leg opening to tightly draw the upper against the leg.

The overshoe 57 has a conductive strap 71 similar to the strap 37 of overshoe 1. An end of strap 71 is caught in seam 13 as illustrated in FIG. 10 to connect the strap 71 to the sole 3 of the overshoe. By connecting strap 71 directly to the sole 3, the intermediate strips of conductive material connected to the uppers of the overshoe 1 can be eliminated. Strap 71 is placed within the street shoe 51 and is positioned across the bottom of the foot and in the toe of the shoe, and the overshoe 57 is then fastened in place on the street shoe by tying of the laces 69. Strap 71 provides a conductive path for electricity between the foot and the floor of the operating room through sole 3 to thereby eliminate static electricity in the body and maintain the body at ground potential.

Strap 71, as well as the other conductive straps, the welts and soles of the embodiments of the overshoe of the invention can be made of nylon reinforced Neoprene having carbon black therein as described hereinbefore, or other suitable conductive materials can be used.

A modified form of overshoe of this invention is illustrated in FIGS. 12-15 and is designated generally by the numeral 75. The overshoe 75 is similar to the overshoe 1 of FIGS. 1-6 and like reference numerals have been used to designate the same or similar parts. In the overshoe 75, the welt 5 has end portions 5a adjacent the split heel which are folded over against the adjacent part of the inner surface of the welt and held by the seam 13 and by the line of stitching 19 of seam 15.

The strip 33 of electrically conductive material passes beneath strip 31 and has an upper end portion 33a which turns down over the strip 31, the end of strip portion 33a being caught in the lower line of stitching 35 which holds the strip 31 on the upper 7. In overshoe 75, the lower end of strip 33 is caught in the seam 15 (instead of seam 13) and the binding 29 ends at seam 15.

A strap 37a of conductive material is attached to the strip 33 of conductive material by a row of stitching 77 and the lower end of strap 37a is connected to the inner surface of the portion 5a of the welt by a row of stitching 79. The free end of strap 37a is positionable in a street shoe when it is in the overshoe.

A lace 81 has an intermediate portion attached to the upper 7 at the leg opening by a line of stitching 83 adjacent the split heel of the overshoe by one or more spaced rows of stitching 85.

The overshoe 75 is used in the same manner as the

overshoe 1 previously described with the exception that the lace 81 is used for attaching the overshoe to the leg instead of the strip of Velcro material on the overshoe 1. The modified construction of the welt 5, strip 33 and strap 37a provides an improved path for conducting electricity from the leg and foot to the sole 3.

The overshoes 1, 57 and 75 have a reasonably tight fit over street shoes and the welt 5 connected to the sole 3 in the manner described provides a good fit along the side of the sole of the street shoe. The seams 13 and 15, being inturned seams, are out of contact with the floor and as a result the seams do not readily wear through and the life of the overshoes is increased. The overshoes are easily put on and quickly fastened. The materials used in constructing the soles, welts and uppers of the overshoes are readily laundered and sterilized.

In view of the above, it will be seen that the several objects of the invention are achieved and other advantageous results attained.

As various changes could be made in the above constructions without departing from the scope of the invention, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

I claim:

1. A static-eliminating overshoe for use in operating rooms over street shoes having a sole consisting of an abrasion-resistant electrically conductive elastomeric sheet material, a welt of an abrasion-resistant flexible material extending around the periphery of the sole and secured at its lower margin to the periphery of the sole by a stitched seam, and a cloth upper stitched at its lower margin to the upper margin of the welt, the lower margin of said cloth upper being connected to the upper margin of the welt by a line of overcast stitching securing edges of the cloth and welt in outside-face-to-outside-face relation, the cloth upper being turned up against the overcast stitching and connected thereto by a second line of stitching driven through the upturned cloth upper and the line of overcast stitching.

2. A static-eliminating overshoe for use in operating rooms over street shoes having a sole consisting of an abrasion-resistant electrically conductive elastomeric sheet material, a welt of an abrasion-resistant flexible material extending around the periphery of the sole and secured at its lower margin to the periphery of the sole by a

stitched seam, and a cloth upper stitched at its lower margin to the upper margin of the welt, said cloth upper having a leg opening, at the top thereof, the portion of said cloth upper adjacent the leg opening being split and having two lengths of cooperable fabric fastener material connected thereto adjacent the split, one of the lengths of the fastener material being connected to said upper on one side of the split and having a multiplicity of hook-like pile elements projecting therefrom, the other of the lengths of fastener material being connected to said upper on the other side of the split and having a pile surface adapted for interengagement with the hook-like pile elements for detachably connecting the lengths of material together thereby to close the overshoe.

3. A static-eliminating overshoe for use in operating rooms over street shoes having a sole consisting of an abrasion-resistant electrically conductive elastomeric sheet material, a welt of an abrasion-resistant flexible material extending around the periphery of the sole and secured at its lower margin to the periphery of the sole by a stitched seam, and a cloth upper stitched at its lower margin to the upper margin of the welt, the cloth upper having a leg opening at the top thereof and the upper having overlapping portions at the toe, said overshoe having laces connected to the upper adjacent overlapping portions of the upper for holding the overshoe on a street shoe.

4. An overshoe as set forth in claim 3 wherein the welt has portions overlapping at the toe and said upper is integral at the heel of the overshoe.

5. An overshoe as set forth in claim 4 having a strap of electrically conductive material with one end caught in said stitched seam, the other end of said strap being free and positionable inside a street shoe when the street shoe is inside the overshoe.

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