

[54] **DISPOSABLE PROTECTIVE SHOE COVER**

[76] Inventor: **Joe E. Bryant**, 2283 Saratoga Dr.,  
Decatur, Ga. 30032

[22] Filed: **Mar. 6, 1972**

[21] Appl. No.: **231,911**

[52] U.S. Cl. .... **317/2 B, 36/9 A, 36/11, 36/51**

[51] Int. Cl. .... **A43b 3/14, A43b 3/16, A61n 1/14**

[58] Field of Search ..... **36/9 A, 9 AR, 10, 11, 51; 317/2 B**

[56] **References Cited**

**UNITED STATES PATENTS**

2,628,438 2/1953 Luchs ..... 36/10  
3,381,174 4/1968 Ceraldi ..... 317/2 B

*Primary Examiner*—L. T. Hix

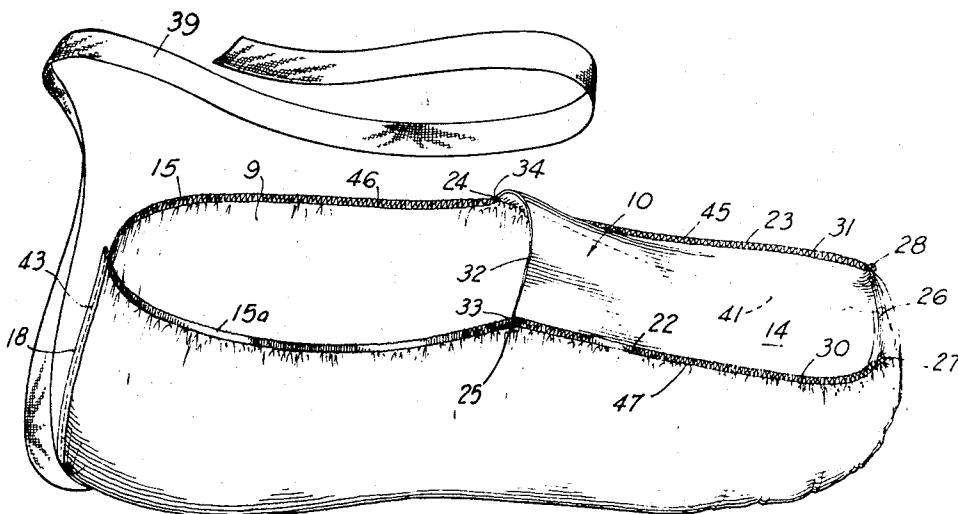
*Attorney, Agent, or Firm*—Newton, Hopkins & Ormsby

[57] **ABSTRACT**

A disposable protective shoe cover formed of flexible

foldable fabric material which has been treated to make it electrically conducting on the outside and water repellent on the inside. The shoe cover is formed from a symmetrical unitary blank having a longitudinal axis, along which is stitched a strip of electrically conducting tape which is adapted to be grounded to the wearer by being placed in physical contact with his leg. The blank from which the shoe cover is made forms a moccasin provided, along its upper surface, with longitudinal elastomeric strips so that they will gather the sole of the cover around the toe of the shoe and hence fit substantially any length of shoe or foot. By such an arrangement, the bottom or sole of the cover is urged to a flattened condition. With the tape installed, the shoe cover is particularly useful in an operating room for arresting the generation of static electricity and for maintaining the shoe or foot of the wearer in a sterile condition. When the tape is not installed, the shoe cover is non-conductive but can be used as a sterile shoe cover in other places.

**1 Claim, 3 Drawing Figures**



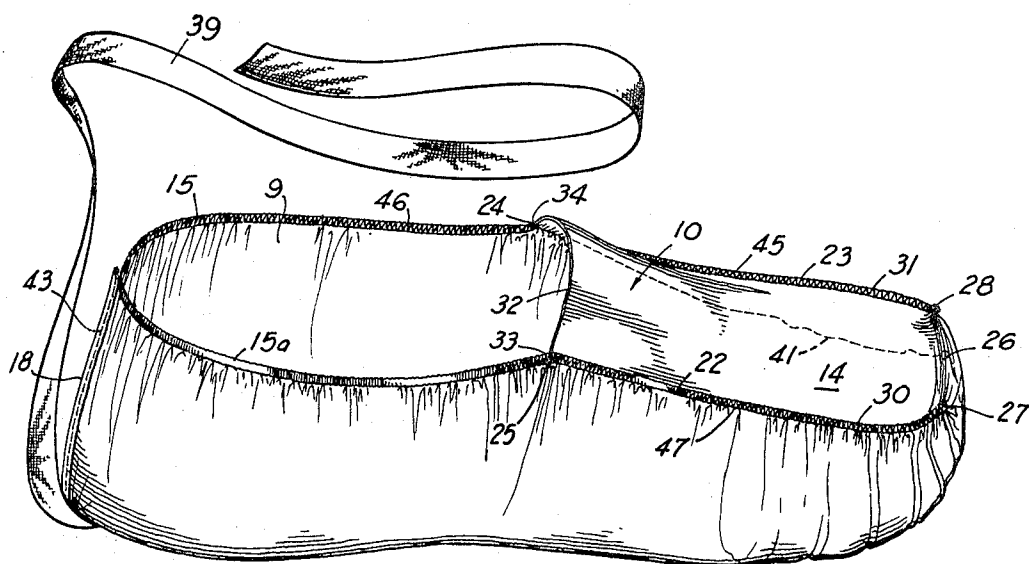


**FIG 1**

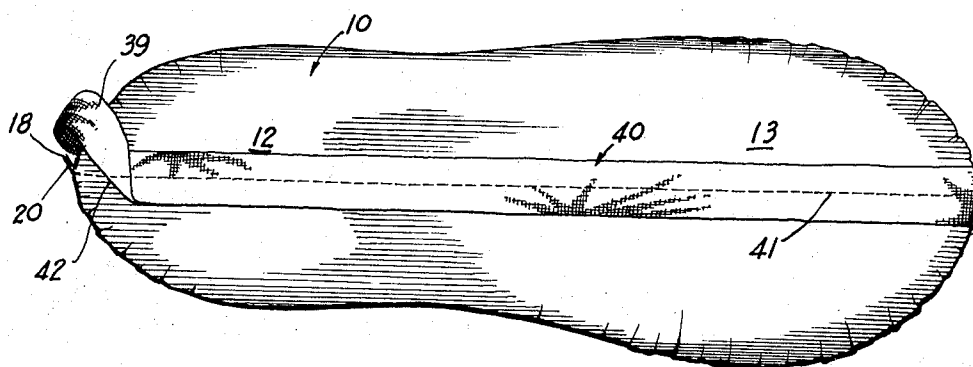


**FIG 2**

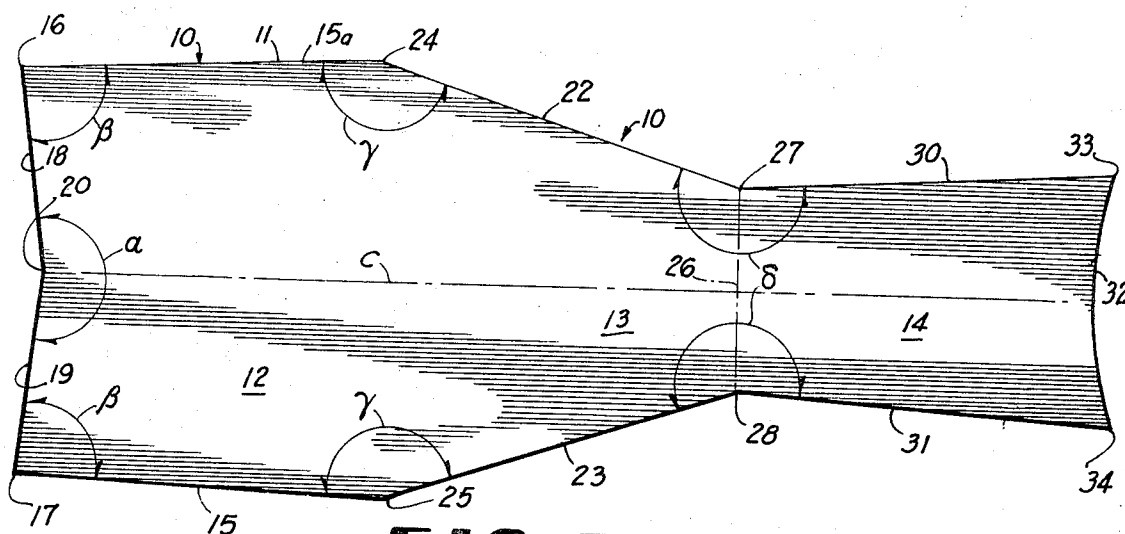


**FIG 3**

**DISPOSABLE PROTECTIVE SHOE COVER****BRIEF SUMMARY OF THE INVENTION**

This invention relates to a disposable shoe cover for use in an operating room as a conductive shoe cover or in general for use as a non-conductive shoe cover. More particularly the present invention is concerned with a slip-on type moccasin formed from a non-woven flexible foldable fabric sheet which can, when desired, be electrically grounded so that the wearer does not generate static electricity by movement of his feet across a surface.

In the past, shoe covers of the general type here disclosed have been manufactured. Generally speaking, such prior art shoe covers have been relatively expensive to manufacture and have included, of necessity, a seam across the bottom portion of its sole which, at times, is uncomfortable to the wearer and will distract the wearer who may, at a particular time, be engaged in a quite delicate operation, requiring his complete attention. The seam of the prior art cover is also pervious and, when in a gathered condition, may permit contaminants to pass through. U.S. Pat. No. 3,648,109 discloses a cover of the general type here discussed.

Briefly described, the shoe cover of the present invention, which obviates the difficulties described above, is formed from a symmetrical unitary blank of thin, flexible, foldable, non-woven fabric which has been coated on one side with a resin and on the other side with a conductive material, the resin side being on the inside of the subsequently produced moccasin and the conductive portion being the outside thereof. The unitary blank has a body at one end portion thereof and a tongue at the other end portion thereof integrally joined by a central tapered shank. The blank is joined against itself along its back edge, the tongue portion being folded back between the edges of the shank so that the adjacent edges lie contiguously. Elastomeric strips stretched along these contiguous edges are stitched into position so as to gather the abutting edges together and gather a portion of the edges around the ankle of the wearer so as to urge the cover into a taut position around the toe of the shoe of the wearer.

Accordingly, it is an object of the present invention to provide a shoe cover which is inexpensive to manufacture, durable in structure and comfortable to wear.

Another object of the present invention is to provide a shoe cover which will effectively protect the shoe of the wearer against the contamination from the floor.

Another object of the present invention is to provide an inexpensive shoe cover which will ground the wearer against static electricity to prevent the wearer from causing an electrical discharge through his body.

Another object of the present invention is to provide a shoe cover which, while being resilient so as to fit substantially any size shoe or foot, nevertheless can be produced, in part, on a conventional sewing machine in which the cost of the sewing operation is materially reduced.

Another object of the present invention is to provide a shoe cover which has no appreciable seam or other protrusion along the bottom to cause discomfort to the wearer.

Another object of the present invention is to provide a shoe cover which is easily sewn from a blank form into its completed condition.

Another object of the present invention is to provide a shoe cover which will gather the excess material of the sole of the shoe cover around the toe of the shoe so as to retain the sole in a taut condition, regardless of the size of the shoe.

Another object of the present invention is to provide a shoe cover which does not bind across the top of the shoe or foot of the wearer to cause discomfort.

Another object of the present invention is to provide a shoe cover which will more readily fit various size heels of a shoe and will more readily be retained on the shoe, once it has been installed.

Another object of the present invention is to provide a shoe cover which will not readily be pulled off by a cleansing device as the wearer enters through the front door of an operating room.

Another object of the present invention is to provide a shoe cover which is less permeable and, hence, will protect the foot of the wearer to a greater extent of the prior art devices.

Other objects of the present invention will become apparent from the following description when taken in conjunction with the accompanying drawings wherein like characters of reference designate corresponding parts throughout the several views.

**DESCRIPTION OF DRAWINGS**

FIG. 1 is a perspective view of a shoe cover constructed in accordance with the present invention;

FIG. 2 is a bottom plan view of the shoe cover disclosed in FIG. 1; and

FIG. 3 is a plan view of the blank from which the shoe cover of FIGS. 1 and 2 is constructed.

**DETAILED DESCRIPTION**

Referring now in detail to the embodiment chosen for the purpose of illustrating the present invention, the blank, depicted in FIG. 3, is generally denoted by numeral 10. This blank is formed from a flexible, foldable, non-woven material or fabric which has been coated, printed, impregnated or treated on its outer surface with an electrically conducting substance such as an electrically conducting paint or dye 11 and which has been coated on the inside with a resin 9 or other film forming material to render the same impervious to liquids under normal conditions. Such a material is known as "Tyvek". If it need not be electrically conducting, but water repellent or resistant, a fabric material known as "Kaycel" may be utilized for the blank 10.

In the present embodiment, the paint or dye 11 is formed in parallel-spaced strips along the outer surface of the sheet or fabric from which the blank 10 is made; however, any other manner of rendering the outer surface of the sheet electrically conducting is suitable.

The blank 10 includes a relatively wide, generally rectangular body 12 at one end, a tapered or trapezoidal intermediate or central shank 13 and a smaller generally rectangular tongue 14 at the other end. The blank 10 is symmetrical along its longitudinal axis or center line "C38".

The body 12 is provided with a pair of complementary, equal length, opposed, straight, slightly forwardly diverging, mouth defining edges or side edges 15 and 15a which, in the completed moccasin, form opposite

side edges for the mouth of the moccasin. These straight side edges 15 and 15a commence at the rear corners 16 and 17 of the body 12 and terminate at the forward end of the body 12. Projecting inwardly from the rear corners 16 and 17 of the blank 10 are a pair of complementary, equal length, straight, forwardly converging, back or rear edges 18 and 19 which intersect at the heel or point 20 at the center line C in an angle  $\alpha$  of approximately  $202^\circ$ . The corners 16 and 17, however, form acute angles  $\beta$  of approximately  $83^\circ$ .

The forward end portion of body 12 is integrally joined to the tapered shank 13, the latter being defined by opposed complementary straight, forwardly converging shank edges 22 and 23. Thus, the edges 15a and 15, respectively, intersect edges 22 and 23 in obtuse angles  $\gamma$  of approximately  $148^\circ$  at corners 24 and 25.

The forward end portion of shank 13 integrally merges with tongue 14, the junction of the two being depicted in FIG. 3 by a traverse fold line 26, extending between the opposed corners 27 and 28 which form the terminus of edges 22 and 23, respectively. The tongue 14 is defined by a pair of complementary, straight, opposed, equal length, slightly forwardly diverging edges 30 and 31 and an arcuate edge 32. Edges 22, 23, 30 and 31 are all of equal length for purposes to be described hereinafter. Also, for convenience of manufacture, edges 14 and 15 are equal in length to edges 22, 23, 30 and 31. Edges 22, 30 and 23, 31 subtend angles  $\delta$  of approximately  $210^\circ$ .

The arcuate edge 32 is concaved and joins the forward ends of edges 30 and 31, thereby providing acute angles for the forward corners 33 and 34 of tongue 14.

In the assembly of the blank 10 into the shoe cover depicted in FIGS. 1 and 2, the first step is to stitch, to the blank 10, a ribbon, tape or strip 40 of an electrically conducting material by means of which the shoe cover is grounded or shunted to the leg of the wearer. This ribbon 40 is a flexible fabric member which, like the blank 10, is impregnated or treated with or produced from an electrically conducting foldable, flexible material. Both the blank 10 and ribbon 40 are flat, flexible members which are quite thin and hence do not present any bulges which might make the shoe cover uncomfortable to the wearer or even noticeable, once the shoe cover has been installed on a person's shoe or foot.

In more detail, the floor contacting portion of the conducting ribbon 40 is approximately the length of the shank 13 and body 12, along the center line C and is stitched along this longitudinal axis or center line C to the outside surface of blank 10, utilizing a conventional sewing machine and a conventional cotton thread. Of course, any other type thread may be substituted for the cotton thread without departing from the scope of this invention. Thus, when the stitching is completed, a line of stitching, denoted by numeral 41, is provided, securing the floor contacting portion 41 of ribbon 40 to the bottom or outer surface of that part of the blank 10 which is to form the sole of the shoe. The floor contacting portion 41 is thus secured along blank 10 from a position beginning at approximately fold line 26 and terminating adjacent, but inwardly of, the rear corner 20 formed by back edges 18 and 19. At this point, slightly inwardly of corner 20, the ribbon 40 is folded diagonally at numeral 42 and is carried laterally of the

center line C so that the stitching passes over the fold and binds or secures the diagonal portion 42 in place. The free end portion of ribbon 40 forms the body grounding portion 39 which contacts the skin of the wearer. For speed of assembly, this stitching 41 is commenced at arcuate edge 32 and terminates at corner 20. The stitching is essentially along the center line C, throughout the length of the blank 10.

The second step in the stitching of blank 10 is for the purpose of joining the back edges 18 and 19. Again, a conventional sewing machine is used and the blank 10 is folded along center line C so as to align the back edges 18 and 19, disposing them in contiguous parallel relationship. The blank 10 is then stitched adjacent the back edges 18 and 19 throughout their length to form back stitching 43. The folding over ribbon 40 provides sufficient space, inwardly of corner 20, for the foot of the sewing machine to ride smoothly and quickly over the blank, as it is fed into the sewing machine. The row of stitching 43, thus joins the back edge portions 18 and 19, the stitching extending from corner 20 to the now joined corners 16 and 17.

After the two stitching operations, described above, the blank 10 is now ready to be transferred from the inexpensive conventional sewing machine to the more expensive surging type sewing machine, known in the trade as a "surger". This surger applies simultaneously a stitch and an elastomeric strip, as it gathers a part of the structure being sewn. In the subsequent steps to be described, the top or upper part of the shoe cover is produced.

In more detail, the third operation or step in the sewing of the blank includes folding the blank 10 along its fold line 26 so as to dispose edge 31 adjacent edge 23 or edge 30 adjacent edge 22, as desired. Thus, corner 34 abuts corner 25 or corner 33 abuts corner 24.

The blank 10 is then placed in the surger and sewn in a single operation starting at corner 27 (or corner 28) so as to stitch the juxtaposed edge portions, i.e., edges 31 and 23, together, the surger continuing the stitching along edge 15 to edge 15a and thence joining edges 22 and 30, to terminate at corner 27 (or 28 as the case may be).

It may be found desirable to stop the stitching at the end of edge 16 and then commence sewing again at corner 27 passing rearwardly to join edges 22 and 30.

In any event, the edge portions adjacent edges 23 and 31 are gathered and urged to a gathered condition by elastic strip 45 while edge 15 is gathered on itself and edge 15a is gathered on itself by elastic strip 46. Also, edges 22 and 30 are gathered and joined, elastic strip 47 doing the gathering.

It is now seen that the gathered edges 15 and 16 define, with the non-gathered edge 32, the throat or mouth of the shoe cover. The non-gathered edge 32 forms the front portion defining the mouth so that when a shoe is inserted through the throat, it slides smoothly on this edge 32 into the shoe receiving pocket formed by the moccasin, as the elastic strip 46 is elongated to accommodate the heel portion of the shoe.

Since stitching 43 is formed from non-gathering, non-elastic thread there is no tendency of the heel of the moccasin to be urged off of the heel of the shoe. Instead, the elastic strip 46 resiliently urges the edges 15 and 152 together around the ankle of the wearer.

Since the toe of the moccasin is fairly wide, i.e., between corners 27 and 28, it conforms more readily to the shape of a person's shoe.

When the moccasin or shoe cover is installed covering the sole, sides and upper portion of the shoe, the central area of the body 12 and shank 13 form the sole of the moccasin, while the wings of the body 12 and shank 13 form the sides of the moccasin. The tongue 14 covers the upper portion of the shoe and forms the upper part of the moccasin.

The elastomeric material, i.e., the U-shape elastic band formed by the elastic strips 45, 46 and 47 are in a stretched condition when the cover is installed on the shoe. This urges the tongue 14 rearwardly, thereby tightening and holding taut the sole of the moccasin which is disposed over the sole of the shoe.

Since there is no seam formed along the length of the sole of the moccasin (except insofar as stitching 41 may be called a seam) and the sole and sides being unitary, the moccasin is essentially impervious to liquids. If desired, adhesive may be substituted for the stitching 41 so that the water-tight integrity of the sole is maintained.

When the moccasin is installed on the shoe, the body grounding portion 39 is tucked into the sock or hose of the wearer so as to be in contact with the skin of the leg of the wearer while the floor grounding portion 41 is flat against the sole of the moccasin.

All the gathering of the material of the moccasin is at the upper portion thereof, essentially around the back part of the heel. The edge 32 assures, since it is not gathered, that the mouth of the moccasin remains open for ready access.

The two strips 45 and 47 assure an even gathering of excess material from both sides of the moccasin.

Since all the stitching operations or steps are along straight edges in straight lines, it is done quite easily and quickly, with a minimum of expense.

What is claimed is:

1. A disposable protective shoe cover for preventing contamination of the wearer's shoe, comprising:

a. a blank formed of flexible foldable sheet material, said blank including a body, and a tongue projecting from one end of said body;

b. securing means joining the edge portions of said tongue to the forward edge portions of said body and also joining certain edges of the rear portion of said body to form a moccasin in which the body forms sides and the tongue forms an upper portion, said sides and upper portion defining a pocket for receiving the heel and toe of said shoe and defining an upper opening through which said heel and toe of the shoe are inserted as the moccasin is installed on the shoe, the lower portions of said sides, when installed on the shoe, forming a sole across the bottom of the sole of the shoe, and

c. resilient means connected to and extending longitudinally along the joined edges of said tongue, and body and along the edge of said body defining upper opening for yieldably gathering the material of said upper portion essentially longitudinally between the toe of the moccasin and said upper opening so as to urge the material available for forming said sole around the toe of said shoe and to a flattened condition against the sole of the shoe.

\* \* \* \* \*

35

40

45

50

55

60

65