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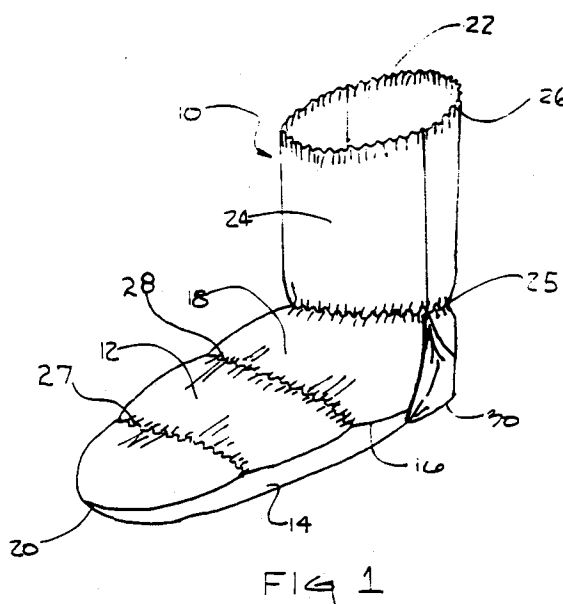
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W-8000 München 22(DE)(54) **Expandable heel shoe cover.**

(57) The present invention is directed to a shoe cover having a generally tube-like shape with an expandable heel portion to allow the shoe cover to better conform to the foot and ankle regions of the wearer despite the simple design of the invention. The expandable heel portion is created by forming a plurality of folds across the width of the section of the material which forms the bottom portion of the shoe cover. The folds are made in the general area of the shoe cover where the heel of the wearer would be positioned. Upon donning of the shoe cover, the heel portion expands as the folds unfold, thereby changing the generally tubular shape of the shoe cover into a shape which more easily conforms to the human anatomy.

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BACKGROUND OF THE INVENTION

The present invention relates to a shoe cover for use as a protective covering over the foot and/or shoe of the wearer. More specifically, the shoe cover of the present invention has a built-in expandable heel which permits the formation of the shoe cover using an extremely simple design yet, upon donning by the wearer, gives the shoe cover a fit which is suitable for use in a wide variety of applications including, but not limited to, health care, surgical and clean room applications.

Disposable shoe covers are often used in the health care, surgical and clean room areas. Their primary function is to be worn over the shoes of the wearer, thereby protecting the wearer from the contaminants in the area in which the shoe cover is worn or, conversely, protecting the environment from contaminants contained in or on the shoe of the wearer. Additionally, the purpose of the shoe cover can be to protect both the wearer and the environment surrounding the wearer from one another.

Clean rooms, health care facilities, and particularly hospital operating rooms, are areas where such shoe covers are most commonly worn. In these environments workers not only wear protective shoe covers, but, they often wear entire suits of clothing including pants, tops, gowns, caps, face masks and gloves. The purpose of such clothing is to minimize contamination of the operating room by bacteria, viruses and other contaminants associated with the wearer and, conversely, the wearer by contaminants within the operating room. Much of the clothing, including shoe covers, worn by such personnel are either disposable, one-use items or washable, reusable items. While simplicity in design is critical in both reusable and disposable shoe covers, it is extremely important with respect to disposable shoe covers, where cost must be cut to a minimum.

Part of the consideration in the cost and simplicity of the design is the ease and speed with which the shoe cover can be made. Elaborate shoe cover designs, while having a higher degree of fit and conformity to the foot and lower leg regions of the wearer, often cost more money to manufacture due to the complexity of their design. In contrast, very simple designs can oftentimes be run on automated equipment, thereby greatly reducing the per-unit cost basis of the material and end product. It is, therefore, an object of the present invention to provide a shoe cover design which is extremely simple in form yet functional to the end user. This and other objects of the present invention will become more apparent upon a further review of the following specification, drawings and claims.

SUMMARY OF THE INVENTION

Disclosed herein is a shoe cover which is simple in design, yet upon donning, has a shape which will conform to the foot and ankle regions of the wearer. The shoe cover is made from a sheet of material which has a generally tube-like shape with an open end for receiving the foot of the wearer and a generally closed end opposite the open end which forms the toe portion of the shoe cover. The shoe cover further includes a top portion and a bottom portion with the bottom portion having at least a first fold and a second fold to form an overlapping hinge portion between the first and second folds. The overlapping hinge portion creates an additional amount of material in the area of the heel of the wearer which is at least partially expandable to create a heel portion when the shoe cover is donned.

In a more refined embodiment, the bottom portion of the shoe cover includes a first fold, a second fold, a third fold, and a fourth fold with the second and third folds defining an expandable hinge portion to accept the heel of the wearer and the first and fourth folds overlying the hinged portion between the second and third folds.

The design of the present invention provides an extremely simple shoe cover which is very easy to make because of its generally planar design. In addition, because of the planar design, the shoe cover lies relatively flat, thereby making it easier to stack, fold and ship.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a perspective view of a shoe cover according to the present invention.

Figure 2 is a top view of a flattened-out version of the shoe cover of the present invention.

Figure 3 is a cross-sectional side view of a flattened-out shoe cover according to the present invention including an expandable heel portion and elastic.

Figure 4 is a cross-sectional side view of yet another shoe cover according to the present invention including a different expandable heel portion from that shown in Figure 3.

DETAILED DESCRIPTION OF THE INVENTION

The present invention is directed to a shoe cover which incorporates an expandable heel in its design. While the shoe cover of the present invention will be described in conjunction with its use in surgical and operating room uses, this should not be considered a limitation as to the scope of the present invention. To the contrary, the present invention is intended to be used in all areas where

protective coverings of the shoe and/or foot are necessary or desirable.

Referring to Figure 1, there is shown a shoe cover 10 according to the present invention made from a sheet material including a top portion 12 and a bottom portion 14 joined along peripheral side seams 16 to form a generally tube-shaped body 18 having a generally closed end or the toe portion 20 and a generally open end 22 opposite the closed end 20 for receiving the foot and/or shoe of the wearer (not shown). In Figure 1, the shoe cover 10 is rather tall in design and, therefore, has a leg portion 24 which is also tubular-shaped and intended to extend above the ankle and foot of the wearer (not shown). The shoe cover of Figure 1 further includes an elastic retention means 25 about the ankle portion of the shoe cover 10, elastic retention means 26 located about the generally-open end 22 for retaining the uppermost portion of the leg portion 24 about the leg of the wearer (not shown) and additional elastic retention means 27 and 28 which extend laterally across the width of the top portion 12 to better conform the top portion 12 to the wearer's foot. In addition, by limiting the elastic retention means 27 and 28 to the top portion 12 of the shoe cover 10, the bottom portion 14 can remain relatively flat to better contact walking surfaces.

The elastic retention means 25-28 may be made from any number of suitable materials which will cause the material of the shoe cover 10 to contract about the foot and/or ankle of the wearer. Elastic and/or heat-shrinkable polymers and rubber are but a few examples of materials which may be used in such situations. Attachment of the elastic members 25 through 28 may be made by such methods as stitching, gluing, thermal bonding and/or ultrasonic bonding.

The material chosen to manufacture the shoe cover of the present invention should be readily conformable to the foot, ankle and leg portions of the wearer. Suitable materials may, therefore, include woven and nonwoven materials as well as plastic films. One material which is particularly well suited for the present invention is a nonwoven laminate comprising a layer of fine microfibers sandwiched between and laminated to two outer layers of more rigid spunbond material such as is disclosed and claimed in U.S. Patent No. 4,041,203, which is commonly assigned to the assignee of record, Kimberly-Clark Corporation. This material is sold by the Kimberly-Clark Corporation under the trademark EVOLUTION® fabric. Sealing of the material which forms the top and bottom portions may be by stitching, gluing, bonding or any other suitable means. The Kimberly-Clark EVOLUTION® fabric is made from polypropylene. As a result, thermal and ultrasonic bonding are two

particularly suitable means for forming the peripheral side seams 16.

Referring to Figs. 2 and 3 of the drawings, the bottom portion 14 has an expandable heel portion 30 created by placing a plurality of folds across the width of the shoe cover 10. As shown, the bottom portion 14 has at least a first fold 36 and a second fold 38 to form an overlapping hinge portion 40 between the first and second folds 36 and 38. The hinge portion 40 is at least partially expandable upon donning to create the heel portion 30. It should be appreciated that this hinged portion 40 can be formed in either one of two ways by simply reversing the direction of the first and second folds. As shown in Figures 2 and 3, the first fold 36 causes the material of the bottom portion 14 to be folded back up on itself in the direction of the toe portion 20 while the second fold 38 causes the material to be folded back upon itself in the direction of the open end 22. As a result, the hinged portion 40 lies between two layers of the material of the bottom portion 14 with the first fold 36 being closer in proximity than the second fold 38 to the open top end 22. As the shoe cover 10 is donned, the hinged portion 40 can expand to form the heel portion 30 as shown in Figure 1. The heel portion will allow sufficient area across the diagonal part of the wearers foot from the heel to the top of the ankle thereby facilitating donning and fit.

A more elaborate heel portion 301 is shown in Figure 4. As with the other embodiment, the shoe cover 101 includes a top portion 121, a bottom portion 141, a toe portion 201, an open top end 221 and a sealed periphery 161. The shoe cover 101 may also be provided with elastic retention members 251, 261, 271 and 281 about the ankle region 291 and open top end 221 and the top portion 121, respectively. Unlike the heel portion 30 in Figures 2 and 3, the heel portion 301 has a first fold 361, a second fold 381, a third fold 401 and a fourth fold 421. The second and third folds 381 and 401 form an expandable hinge portion 441 with the first and fourth folds 361 and 421 overlying the hinge portion 441 between the second and third fold lines 381 and 401. In a fashion similar to the other shoe cover design of the present invention, as the shoe cover 101 is donned, the hinged portion 441 can expand to form a heel portion such as the heel portion 30 shown in Figure 1.

Having thus described the invention in detail, it should be appreciated that various modifications and changes can be made without departing from the spirit and scope of the following claims.

Claims

1. A shoe cover comprising:

A sheet of material having a generally

tube-like shape for generally conforming to at least the foot and ankle portions of a wearer, said tube-like shape defining an open end for receiving the foot of the wearer, a generally closed end opposite said open end, a top portion and a bottom portion, said bottom portion having at least a first fold and a second fold to form an overlapping hinge portion between said first and second folds, said overlapping hinge portion being at least partially expandable to create a heel portion when the shoe cover is donned.

2. A shoe cover comprising:

A sheet of material having a generally tube-like shape for generally conforming to at least the foot and ankle portions of a wearer, said tube-like shape defining an open end for receiving the foot of a wearer, a generally closed end opposite said open end, a top portion and a bottom portion, a first fold, a second fold, a third fold and a fourth fold in said bottom portion, said second and third folds defining an expandable hinge portion with said first and fourth folds overlying said hinge portion between said second and third folds, said expandable hinge portion being at least partially expandable to create a heel portion when the shoe cover is donned.

3. The shoe cover of claim 1 which further includes retention means extending laterally across said top portion of said shoe cover.

4. The shoe cover of claim 2 which further includes retention means extending laterally across said top portion of said shoe cover.

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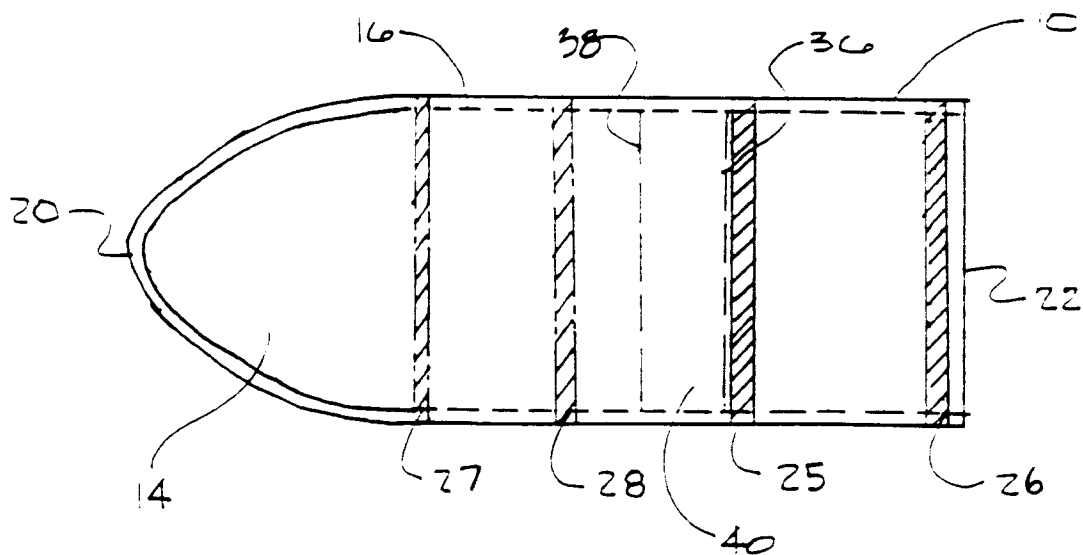
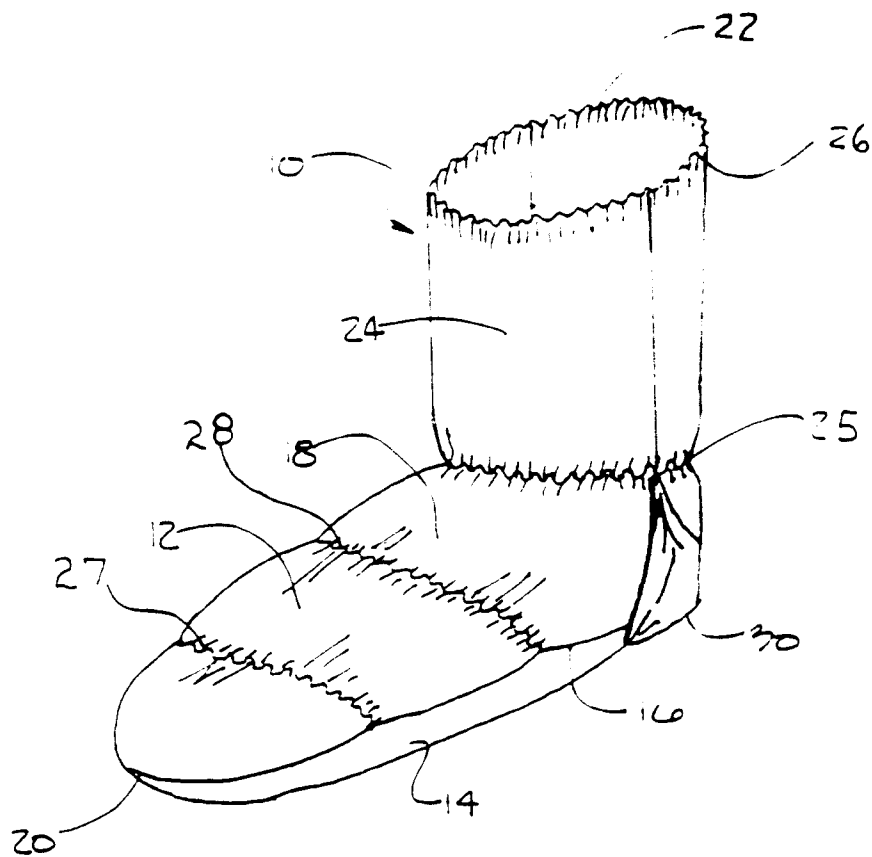
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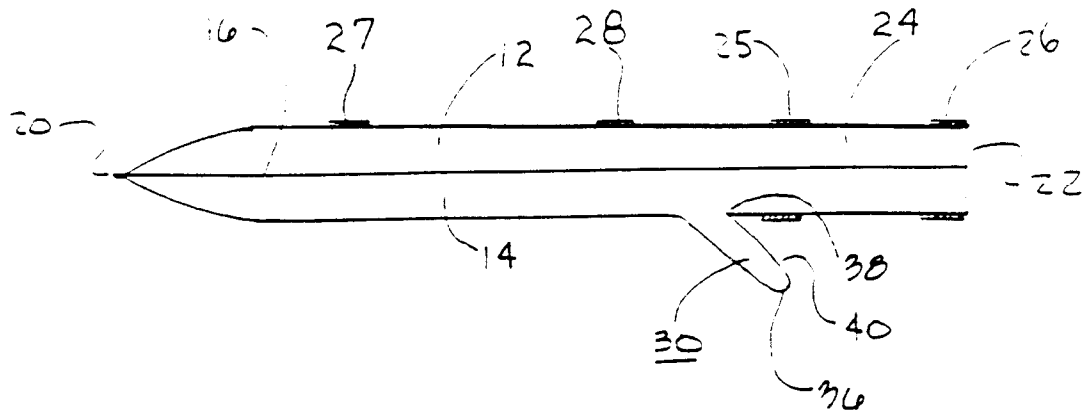


FIG 3

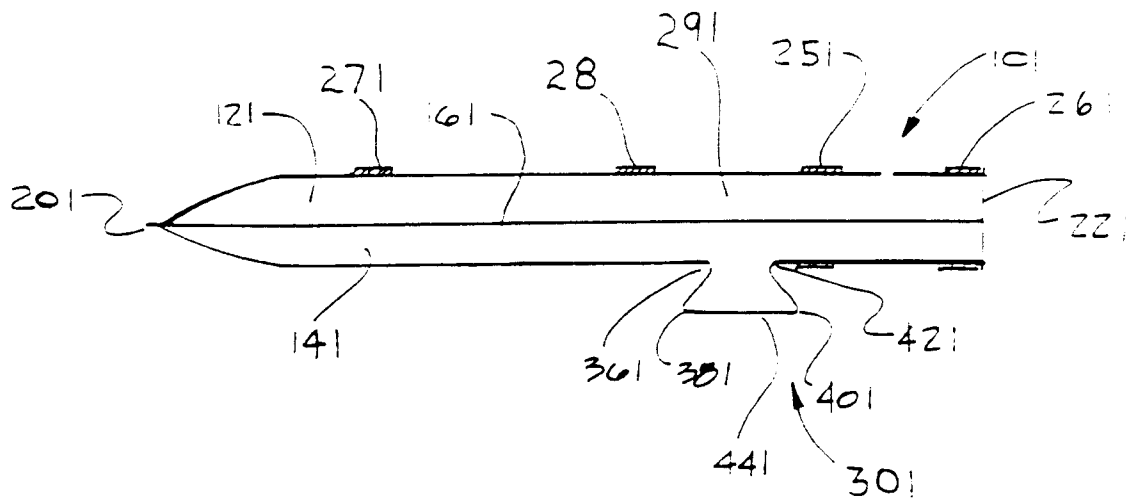


FIG 4