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Tundermann

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[54] **DISPOSABLE FOOT CARE ARTICLE AND METHOD OF MANUFACTURE THEREOF**

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[52] **U.S. Cl.** ..... **128/260**; 128/81 R

[51] **Int. Cl.** **A61m 35/00**; A61m 37/00

[58] **Field of Search** ..... 128/260, 581, 606, 166.5, 128/81 R; 15/227; 2/61, 239; 36/9 A, 10, 8.1; D2/283

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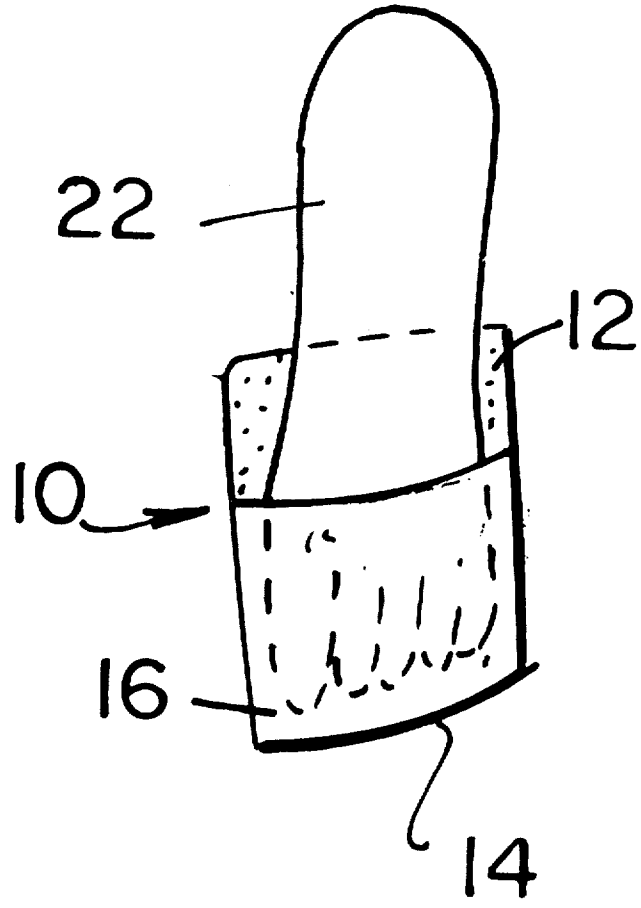
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[57] **ABSTRACT**

A disposable foot-care article in the form of a toe cover made of absorbent non-woven fabric or suitable stock, and method of manufacturing same that utilizes a continuous web wherein the web is impregnated with medicated foot-care agents, folded longitudinally into at least a partial overlap and then sealed and cut diagonally to produce a slipper-shaped toe cover.

11 Claims, 6 Drawing Figures



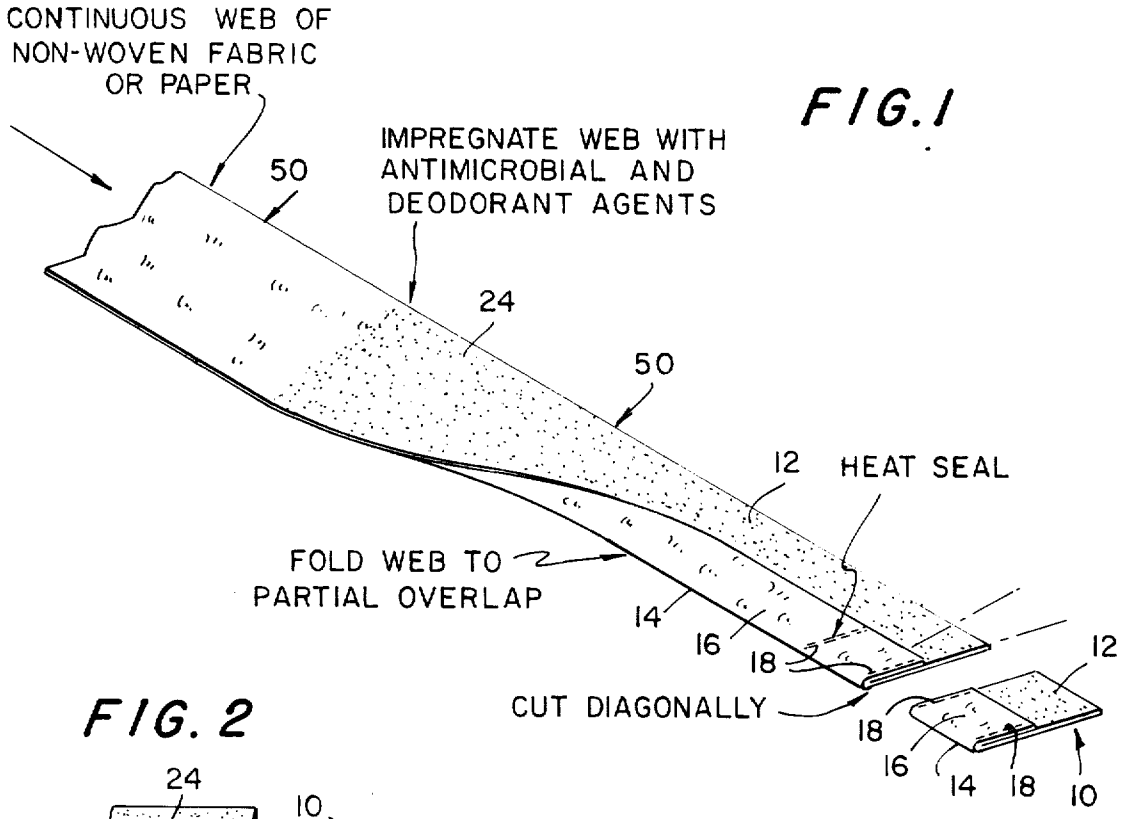
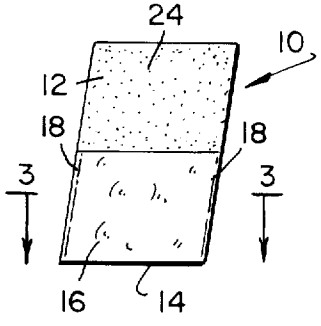


FIG. 1

FIG. 2



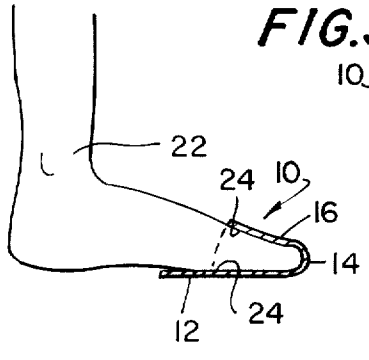


FIG. 4

FIG. 3

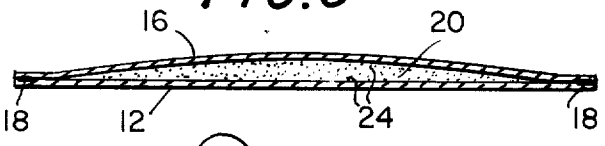
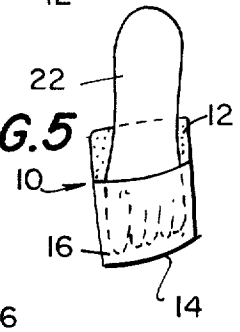


FIG. 5



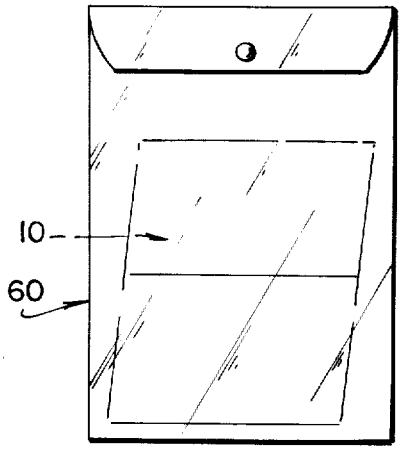


FIG. 6

DISPOSABLE FOOT CARE ARTICLE AND METHOD OF MANUFACTURE THEREOF

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to a foot care toe cover and method of manufacture thereof that is adapted to release deodorizing and antifungal agents or the like, and be absorbent of perspiration.

The toe cover is manufactured from a continuous web that is impregnated, folded longitudinally, and heat sealed, or the like, and cut diagonally before being packaged. The toe cover is capable of rendering continuous medication for extended periods of time and the method of manufacturing the article is capable of highly efficient high speed operation, allowing the toe cover to be produced inexpensively.

2. Description of the Prior Art

Various types of foot care devices and products have been employed in the past in the form of powders, creams, and sprays.

These products have a short time activity and can be inconvenient and messy to apply.

Prior foot covering devices have been used such as shown in U.S. Pat. Nos. 1,637,285 and 3,299,894. These patents show foot coverings that are utilized as moisture absorbent appliances or as blister preventive shields. The prior devices are shaped to fit the foot tightly and are elastic so the foot could be placed into the covering.

U.S. Pat. No. 1,659,171 shows a partial stocking shape device that is adapted to give the foot support by utilizing a plurality of layers. The device must be shaped and dimensioned to fit the foot exactly so the layers of stuffing can engage the foot and render support at the proper location.

In the past, the devices were expensive to manufacture as they were designed to fit the foot exactly and were adapted to be used many times. The materials utilized were light woven fabrics so the devices could be flexible and durable.

It was difficult, utilizing the prior art, to have an inexpensive but effective means of continuously treating a foot ailment.

SUMMARY OF THE INVENTION

The present invention comprises a disposable foot-care toe cover, and a method of manufacturing same that overcomes certain disadvantages of the prior art, especially where continuous application of medication is desired. The presently to be disclosed invention overcomes prior disadvantages of the art and provides benefits by virtue of its composition, form, and low manufacturing cost.

In the present invention, the device is made of non-woven material in the form of a partial slipper which covers the toes, and may be worn under a sock or stocking during the day. The non-woven material helps to absorb foot perspiration and acts as a carrier for medication such as fungicidal and deodorizing agents or the like, which may be held in the interstices of the fibers or may be coated on the surface of the toe cover in the form of moisture sensitive micro-capsules or molecular sieve powders.

It is therefore an object of this invention to provide for simple and non-messy application of foot care medications. Further, to provide all day activity of the desired foot-care agents.

One feature of the present invention resides in the provision that the toe cover lends itself to a rapid manufacturing method as set forth herein.

Another object of the invention is to provide a foot care device made of a single sheet of material.

Another object of the present invention is the provision that a continuous web can be impregnated by a dusting or spray-and-dry step, or the like, followed by folding, bonding, and cutting in high speed production manner.

A still further object of the present invention is to provide a foot care means manufactured from a continuous web that is impregnated from one side.

These objects and other features of the invention, which will become apparent as the following description proceeds, are attained by this disposable foot care article and method of manufacture thereof, a preferred embodiment of which are shown in the accompanying drawing by way of example only, wherein:

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a schematic representation of the continuous web as it proceeds through the steps of being manufactured into a foot-care article according to the concepts of the present invention;

FIG. 2 is a top plan view of a toe cover according to the concept of the invention;

FIG. 3 is a vertical sectional view thereof, taken along the plane of line 3—3 in FIG. 2;

FIG. 4 is a longitudinal sectional view thereof shown engaged on a foot;

FIG. 5 is a top plan view of the foot care article shown engaged on the foot; and

FIG. 6 is a top plan view thereof shown packaged.

DETAILED DESCRIPTION OF THE INVENTION

With continuing reference to the accompanying drawing wherein like reference numerals designate similar parts throughout the various views, reference numeral **10** is used to generally designate a disposable foot-care article in the form of a toe cover constructed in accordance with the concepts of this invention.

The toe cover **10** is of one piece construction of non-woven fabric, paper, or the like that is capable of being bonded or heat sealed, that can be easily and inexpensively manufactured according to the concepts of this invention.

The article **10** includes a lower parallelogram-shaped sole portion **12.** At the front edge of the sole is a diagonal fold **14** that defines the upper or last portion **16** which extends upwardly and rearwardly back over the front portion of sole **12.** The upper portion **16** is a parallelogram -shaped member somewhat shorter than sole **12** whereby sole **12** extends rearwardly of the upper portion **16.**

The fold **14** defines a line that is on an acute angle to a perpendicular of the longitudinal side edges of the sole portion **12.** These foot care articles for right and left feet can be easily produced by merely a variation in the aforesaid angle. The parallel side edges of portion **16** and sole **12** coincide and are sealed together along the length of their coexistence along parallel sealing paths **18,** by heat, adhesives, or the like.

The forward section of sole **12** and the upper portion **16** are fixed together on three sides, by fold **14** at the

front and sealed portions **18** on the sides, thereby defining a pocket **20** open at the rear edge of upper portion **16.** Pocket **20** is dimensioned such that it is adapted to receive the foot of a user **22** by inserting the toes and forward section of the foot **22,** below portion **16** and on top of sole **12.**

The upper surface of sole **12** and the lower surface of portion **16** are impregnated with medicated foot care agents, **24** such as, but not limited to, antimicrobial, fungicidal, and/or deodorant agents. Therefore, when a users foot **22** is inserted into pocket **20** the medication **24** engages the toes and forward section of the foot **22.**

The partial slipper form of the toe cover **10** surrounds the toes and may be worn under a sock or stocking during the day. The non-woven material of the toe cover **10** may be a wet strength paper and helps to absorb foot perspiration, thereby aiding foot comfort, and acts as a carrier for antifungal and deodorizing medication **24,** or the like, which may be in the interstices of the fibers or may be coated on the surface of the toe cover **10** in the form of moisture sensitive microcapsules or molecular sieve powders.

Examples of the possible medicated agents **24** is an anti-fungal agent such as undecylenic acid recommended for athletes foot, a deodorant ingredient and antibacterial agent such as trichloro-2-hydroxy diphenyl ether and mild astringents such as zinc phenolsulfonate.

The toe cover **10** is of one piece construction and may be manufactured by a method utilizing a continuous web **50** of non-woven fabric or paper, capable of being bonded or heat sealed, or the like.

The method of manufacturing toe covers **10,** as shown schematically in FIG. **1,** utilizes a continuous web **50** of material that is created by a paper making or non-woven web making machine. Web **50** is then impregnated from one side with any desired foot care agents **24** that can be applied by dusting or spray-and-dry equipment, or the like. The web **50** is then folded longitudinally to at least a partially overlapping position whereby the impregnated surfaces are facing each other. The longitudinal fold **14** creates an upper portion **16,** and a longer sole portion **12** that extends rearwardly of portion **16.** The two portions **12** and **16** are bonded together along the length of their coexistence along parallel sealing paths **18** that are on an acute angle to a perpendicular of the line defined by the longitudinal fold **14.** The portions **16** and **12** are bonded together by means of adhesives, heat sealing, or the like.

The impregnated, folded, and sealed web **50** is then completely cut on a diagonal to the folded edge **14.** The cutting of web **50** takes place along a line that exactly coincides with the center line of the sealing paths **18.** The sealing path **18** is sufficiently wide so that the portions **12** and **16** are bonded together on either side of the cut positioned in the sealing path **18.** Thus, after web **50** has been completely severed, creating toe cover article **10,** the sole **12** and upper portion **16** are still sealed together along the edges of their coexistence. It is to be understood that the heat sealing along the side edges and the cutting step may be accomplished simultaneously using a heated cutting blade. Toe covers **10** can be manufactured utilizing high speed impregnating, folding, sealing, and cutting equipment so that continuous sheet of non-woven fabric, or the like, can be efficiently turned into uniform, low cost, disposable foot-care toe covers.

Once severed from web **50,** the covers **10** may be packaged, in any quantity, in a suitable package **60.**

The method of manufacturing toe covers as set forth is adapted such that there is no waste whatsoever of the web **50.** Further, the web **50** is impregnated on one side and then longitudinally folded so that the impregnating agents are utilized and positioned only where they will be highly effective when toe cover **10** is placed on the foot. If separate articles are to be made for right and left feet, the angular relationship of parts can be determined for right and left feet and pairs of foot care articles can be packaged as desired.

A latitude of modification and change is intended in the foregoing disclosure, and in some instances some features of the present invention may be employed without a corresponding use of other features.

I claim:

1. A disposable toe cover of non-woven material comprising a single sheet impregnated with antimicrobial and deodorant agents on one surface thereof, said sheet being folded to define a front edge with an upper portion and a lower sole portion having the impregnated surfaces facing each other said upper portion being continuous and coextensive with said sole portion, and said folded sheet having its side edges sealed to each other, said side edges being defined by parallel straight lines, one of said side edges extending at an acute angle from said front edge, the other of said side edges extending at an obtuse angle from said front edge.

2. A disposable toe cover according to claim **1,** wherein said material is paper having moisture absorptive and wet strength properties.

3. A disposable toe cover according to claim **1,** wherein said agents are selected from the group consisting of undecylenic acid, trichloro-2-hydroxy diphenyl ether, and zinc phenosulfonate.

4. A disposable toe cover according to claim **1** wherein said upper portion is smaller than said sole portion so that said sole portion extends rearwardly of said upper portion.

5. A disposable toe cover according to claim **1** wherein said front edge is defined by a substantially straight line.

6. A method of manufacturing foot care toe covers comprising the steps of impregnating a continuous web of non-woven material with foot-care agents on one side thereof, folding said web longitudinally to at least a partial overlap wherein said impregnated sides faces each other, sealing said overlapping portions along parallel sealing paths that extend at an acute angle relative to a line perpendicular to said fold, and then transversely cutting the entire web along a line extending within at least one of said sealing paths.

7. A method according to claim **6,** wherein said sealing is a heat sealing step.

8. A method according to claim **6,** wherein said sealing is an adhesive sealing step.

9. A method according to claim **6,** wherein said foot-care agent is undecylenic acid.

10. A method according to claim **6,** wherein said foot-care agent is trichloro-2-hydroxy diphenyl ether.

11. A method according to claim **6,** wherein said foot-care agent is zinc phenolsulfonate.

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