A shoe protection article made with a deformable textile that contains an antimicrobial agent. The shoe protection article is placed over a shoe tree, and the shoe tree is inserted into a shoe so that the shoe protection article comes into contact with a substantial portion of the interior surface of the shoe, thereby providing antimicrobial benefits to the shoe. The shoe protection article may cover a toe portion of the shoe tree or also the heel portion depending on the amount of contact desired. Various antimicrobial agents may be used such as silver dihydrogen citrate, and various textiles may be selected based on compatibility with the antimicrobial agent. A moisture-proof container protects the shoe protection articles before use to preserve the effectiveness of the antimicrobial agent.
SHOE PROTECTION ARTICLE

FIELD OF THE INVENTION

[0001] The invention relates to an article intended for protecting the interior of footwear such as a shoe.

BACKGROUND OF THE INVENTION

[0002] The article “Antimicrobial Textiles—an Overview,” by Dr. T. Ramachandran, K. Rajendran, and R. Rajendran (The Institution of Engineers, India, Journal of Textile Engineering [IE (I) TX], Vol. 84, February 2004), provides helpful and substantial background information with respect to textiles that carry antimicrobial agents. The Ramachandran article is incorporated herein by reference in its entirety for its useful background information that relates to providing a textile with antimicrobial properties, and specifically pages 42-45 are expressly incorporated.

[0003] As is well understood, and as stated in the Ramachandran article, microbial infestation poses danger, to both living and non-living matter, including bad smell, communication of disease, staining, and material degradation.

[0004] Ramachandran recommends the use of antimicrobially treated textiles in various applications, including:

[0005] sanitary materials, dressing materials, surgical threads, materials for filtration of gases and liquids, air conditioning and ventilation, constructional materials, special materials for food industry, pharmaceutical industry, footwear industry, clothing industry, automotive industry etc.

[0006] Using antimicrobially treated textiles for the fabrication of footwear can result in an article of footwear that resists infection from microbes, but it is not always desirable to have an article of footwear that is comprised of a substantial amount of textile material. In particular, dress shoes are typically leather and do not include an inner textile lining. Furthermore, consumers do not want leather shoes that are lined. Finally, even if an antimicrobial lining were provided within a dress shoe, it would lose effectiveness over time and eventually become completely ineffective.

[0007] Therefore, the mention in Ramachandran to use antimicrobially treated textiles in the footwear industry has only a limited practical application.

[0008] In U.S. Pat. No. 3,882,808, Tundemann describes an open envelope-shaped disposable foot care article made of an absorbent non-woven fabric. The article delivers medication or other substances to a wearer’s foot, and is worn underneath a sock and adjacent to the toes. A figure from Tundemann is shown below as related art FIG. 1. The figure shows an elongated sole portion 2 that accommodates the underside of a wearer’s foot 4. The article is of a folded-over construction which, when considered together with elongate sole portion 2, is reminiscent of an open envelope with sole portion being the envelope’s open flap. The purpose of the sole portion is to permit the weight of the wearer to help maintain the article in position. The use of the non-woven material is for the sake of absorbing perspiration and moisture from the part of the wearer’s foot in contact with the article.

[0009] Although the Tundemann approach can medicate a wearer’s foot, it is worn underneath a sock or the like to maintain the article’s position on the foot. Therefore, the Tundemann foot care article does not come into contact with the external footwear. Thus, the external footwear receives no direct benefit from the agent carried by the foot care article. Moreover, the foot medication is not meant for protection of a shoe or the like, but of the foot. For its discussion of the foot care article and a manner of producing the same, the entirety of the Tundemann patent is incorporated herein by reference, in particular the text from col. 1, line 1 through col. 3, line 63, and the accompanying figures.

[0010] U.S. Pat. No. 6,393,734 to Ou describes an adjustable and disposable foot care article. The Ou foot care article, like that of Tundemann, has an elongated sole portion. In the Ou article, however, the sole portion extends to fully support the bottom of the foot. Ou also provides for side flaps and a heel portion which may be fastened together with an adhesive tape or the like. The primary function of the disposable foot care article of Ou is described as follows:

[0011] The article gives the foot and toes and part of the instep protective cover without contacting the dusty or microbes-infected shoe interior. It may serve as a substitute for sock or stocking, or be worn with stocking or sock in the shoe without exposed or spoiling aesthetic appearance.

[0012] The foot care article of Ou, like that of Tundemann, was created with the intention of treating the foot of the wearer. Ou’s approach gives no benefit to the article of footwear, having no interaction with the shoe interior other than to shield the foot from the shoe interior. Tundemann acknowledges the need for protection of the foot from the shoe interior, but not the need for protection of the shoe interior itself.

[0013] Another approach taken with respect to alleviating issues associated with footwear is the shoe insert approach. In this approach, a pad is provided in a position between the sole of the wearer’s foot and the lower interior surface of the shoe. The shoe insert usually provides improved padding and comfort for the wearer. In U.S. Pat. No. 7,047,671 to Steed, there is described a disposable shoe sheet that absorbs moisture and thereby helps prevent microbial infestation. Steed recommends the use as well of beneficial agents in the shoe sheet, such as deodorizers, fragrance, or antimicrobial agents. The Steed document is incorporated by reference in its entirety for its useful discussion of the structure of a shoe insert.

[0014] The shoe insert approach is disadvantageous in that the insert does not come into contact with most of the interior of the toe area. Only the part of the shoe that contacts the wearer’s sole can benefit from the effect of a shoe insert. In addition, the shoe insert needs to be sized so that it is appropriate for the type of shoe being used. Since shoes vary greatly in length, width, and shape, it is necessary to produce the shoe insert in a variety of shapes and sizes, or to rely on the user to modify the insert to fit the particular shoe being worn.

[0015] Several attempts have been made to expressly provide for the protection or improvement of the interior of footwear such as shoes. In U.S. Pat. No. 2,460,405, Abrams teaches a shoe tree 6 having a compartment 8 that is intended to hold a filler that may have disinfectant or deodorizing properties (see related art FIG. 2). The filler may be liquid or paste applied to gauze or the like, or granular material. One disadvantage to the Abrams approach is that the compartment is of a peculiar shape, and could prove difficult to refill if actually put into practice. The fact that Abrams is an old reference, taken together with the lack of any implementation in the market of such an article, together show that the consumer has little interest in this approach to providing protection for a shoe.

[0016] In U.S. Pat. No. 2,510,315, Malberg teaches a shoe tree 10 having a generally hollow construction, the whole of
which forms a compartment 12 that may more easily be filled with a disinfectant (see related art FIG. 3). The feature of a shoe tree with more easily replaceable disinfectant, owing to a large, single, hollow, interior compartment represents an advancement over Abrams in that the need to cope with compartments of a small and peculiar shape is obviated. On the other hand, both Abrams and Malberg rely on the approach of a specially adapted shoe tree, in which a disinfectant material is only partially in contact with an interior surface of a shoe.

[0017] That is to say, the use of a specially adapted shoe tree is disadvantageous since many consumers already possess shoe trees, and do not want to purchase additional shoe trees. Moreover, the use of compartments within the shoe tree means that the presence of the disinfectant material is limited to the interior of the compartments, and so the contact between the beneficial agent and the shoe’s interior is very limited.

[0018] In U.S. Pat. No. 3,200,427 to Daley, there is taught a shoe tree cover 14 (see related art FIG. 4). The shoe tree cover is generally the shape of a cup, is made of cloth, and contains a compartment 16 for holding an effervescent beneficial agent. The compartment is arranged so as to be positioned at the underside of the shoe tree. The cover is made of an outer casing of two plies of cloth, and there is also a lining of three plies. As taught by Daley, the significant bulk represented by the cloth shoe tree cover has an advantage in that it conforms to the interior of the shoe, making the engagement of the shoe tree and the interior of the shoe more form-fitting.

[0019] The compartment 16 of the cloth shoe tree cover accommodates a flat, absorbent pad 18. The pad helps fill out the interior of the shoe, thereby enhancing the effect of the shoe tree, and also acts as a carrier for a fluid ingredient that can combat odor or contamination. The pad and the shoe tree cover are washable and reusable. After a washing, the pad must be soaked in the beneficial agent to restore its ability to combat odor or contamination.

[0020] The approach of using a shoe tree cover helps overcome some of the disadvantages of approaches such as that of Abrams and Malberg. Namely, the need for a specialized shoe tree having compartments is avoided since the compartment within the Daley shoe tree cover can be brought into operational cooperation with any one of a number of normal shoe tree shapes. On the other hand, Daley retains the disadvantages of using compartments, i.e., the presence of the disinfectant material is limited to the interior of the compartment, and so the contact between the beneficial agent and the shoe’s interior is very limited. Furthermore, the Daley shoe tree cover is complex to make and unfortunately requires periodic washing and replenishing of the agent within the compartment.

[0021] Although various approaches to protecting footwear have been heretofore recommended by others, not one approach has met with widespread adoption. There is thus a need for a more convenient and effective approach to protecting footwear such as shoes.

SUMMARY OF THE INVENTION

[0022] With an eye toward addressing at least some of the above-mentioned disadvantages of prior approaches, there are now described various embodiments of the invention.

[0023] In one embodiment, the invention resides in an article intended for protecting the interior of a shoe. The article is made of textile formed into a deformable shape approximating essentially a cup and is intended for use in covering a toe portion of a two-part shoe tree. The textile material carries an active antimicrobial agent.

[0024] In one embodiment, the active antimicrobial agent is silver dihydrogen citrate.

[0025] In one embodiment, the rim portion of the cup is gathered.

[0026] In one embodiment, the textile of the article is nylon.

[0027] In an alternative embodiment, the article is made of textile formed into a deformable shape approximating essentially an elongated cup, and is intended for use in covering substantially all of a shoe tree.

[0028] The invention is taught below by way of various specific exemplary embodiments explained in detail, and illustrated in the enclosed drawing figures.

BRIEF DESCRIPTION OF THE DRAWINGS

[0029] The drawing figures depict, in highly simplified schematic form, embodiments reflecting the principles of the invention. Many items and details that will be readily understood by one familiar with this field have been omitted so as to avoid obscuring the invention. In the drawings:

[0030] FIG. 1 is a related art illustration based on the above-identified Tundermann document.

[0031] FIG. 2 is a related art illustration based on the above-identified Abrams document.

[0032] FIG. 3 is a related art illustration based on the above-identified Malberg document.

[0033] FIG. 4 is a related art illustration based on the above-identified Daley document.

[0034] FIG. 5 is an illustration of a shoe protection article covering a toe portion of a two-part shoe tree, according to one embodiment of the invention.

[0035] FIG. 6 is an illustration of a shoe tree positioned inside a shoe, with the shoe protection article inserted over a toe portion of a shoe tree, according to one embodiment of the invention.

[0036] FIG. 7 is an illustration of the shoe protection article further comprising a gathered rim portion, according to one embodiment of the invention.

[0037] FIG. 8 is an illustration of a shoe protection article that covers substantially all of a shoe tree, according to one embodiment of the invention.

DETAILED DESCRIPTION

[0038] The invention will now be taught using various exemplary embodiments. Although the embodiments are described in detail, it will be appreciated that the invention is not limited to just these embodiments, but has a scope that is significantly broader. The appended claims should be consulted to determine the true scope of the invention.

[0039] The shoe protection article, in one non-limiting embodiment, is a textile formed into a deformable shape for covering at least a toe portion of a shoe tree. The shoe tree is placed inside of a shoe when the shoe is not in use by a wearer. The textile of the shoe protection article carries an active antimicrobial agent that protects a shoe from the buildup of microbes and other organisms that cause odor, transmit disease, and degrade the structure and appearance of a shoe.

[0040] The shoe protection article is advantageous in that its deformable shape will easily fit onto almost any existing shoe tree without requiring a separate, customized shoe tree or modification of a shoe tree. In comparison to a customized shoe tree with an insert, the shoe protection article described
herein is both easier and less costly to manufacture. The shoe protection article is also easy to apply to a shoe tree and does not require replacement of an insert or retreatment in a solution. In addition, by covering at least the toe portion of the shoe tree, the shoe protection article comes into contact with a substantial portion of the interior of a shoe and is able to eliminate or prevent microbial infection over a large surface area of the interior of a shoe.

[0041] A first non-limiting embodiment of a shoe protection article is illustrated in FIG. 5. In this embodiment, a shoe tree 102 for receiving the shoe protection article includes a toe portion 104 and a heel portion 106. A shoe protection article 108 is formed in a shape approximating essentially a cup, such that when it is fitted over the toe portion 104 of the shoe tree 102, it essentially takes the shape of the toe portion 104. The shoe protection article 108 includes an opening 110 at one end for fitting the shoe protection article 108 around the shoe tree 102. A rim portion 112 surrounds the opening 110 of the shoe protection article 108.

[0042] Once the shoe protection article 108 is fitted around the toe portion 104 of the shoe tree, the shoe tree 102 is inserted into a shoe 114, as illustrated in FIG. 6. The shoe tree’s position within the shoe 114 is illustrated by the short dashed lines, while the shoe protection article 108 surrounding the toe portion 104 of the shoe tree 102 is illustrated by the longer dashed lines and diagonal line pattern. The shoe protection article 108 then comes into contact with a substantial portion of the interior surface of the shoe 114. Because the textile, of which the shoe protection article is made, carries an antimicrobial agent, it follows that the antimicrobial agent is also in direct contact with the interior surfaces of the shoe and is able to effectively prevent the build up of microbes along the interior surfaces of the shoe.

[0043] In one non-limiting embodiment, the rim portion 112 can be gathered in order to provide a more secure fit around the toe portion 104 of the shoe tree, as illustrated in FIG. 7. The gathered portion provides a smaller diameter for the opening 110 and is more resistant to expansion, thereby discouraging the shoe protection article 108 from sliding off of the toe portion 104 of the shoe tree and facilitating the installation of the combination of the shoe tree and shoe protection article within a shoe. One skilled in the art will appreciate that there are other ways to prevent the shoe protection article from sliding off of the shoe tree, such as a physical snap to connect opposing sides of the rim portion 112.

[0044] In a second non-limiting embodiment illustrated in FIG. 8, the shoe protection article 108 is disposed over both the toe portion 104 and heel portion 106 of the shoe tree in a shape approximating an elongated cup. The opening 110 and rim portion 112 are shown disposed at an upper surface of the shoe tree 102. The elongated cup shape of the shoe protection article 108 covers substantially all of the shoe tree 102, and particularly the surface of the shoe tree that comes in contact with the interior surface of the shoe. This particular embodiment thus provides substantial protection of the interior surface of the shoe from microbial infection. Additionally, the position of the opening 110 on the upper surface of the shoe tree 102 also provides for a more secure fit of the shoe protection article 108 around the shoe tree 102, since the shoe protection article is wrapped substantially around the toe portion 104 and the heel portion 106 of the shoe tree 102. One skilled in the art will appreciate that the shoe protection article can be formed in the elongated cup shape and still have an opening at another end, such as the heel portion 106, although a gathered rim portion may be desired in order to prevent the shoe protection article 106 from too easily slipping off the shoe tree 102, or at another side, such as a bottom side of the shoe tree 102. Having the opening at the top side may be preferable since the foot opening of shoes is generally at the top side.

[0045] The textile that makes up the shoe protection article can be any variety of textile capable of taking on a deformable shape to surround the shoe tree. In one non-limiting embodiment, the textile is nylon. The textile can, however, be cotton, polyester, spandex, wool or any other natural or synthetic fiber, including a blend of more than one textile. [Inventor: please verify accuracy of the above statement regarding the type of textiles used] An elastic textile such as spandex provides the benefit of a secure fit around the shoe tree. However, the textile should also be selected based on its compatibility with the antimicrobial agent, in terms of how easily the textile and the antimicrobial agent adhere to one another, and how well the antimicrobial agent remains on the textile.

[0046] The antimicrobial agent, in one non-limiting embodiment, is silver dihydrogen citrate. Other antimicrobial agents are known to those familiar with this field, and still other antimicrobial agents may be developed in the future.

[0047] There are several different approaches to providing the textile material with the active antimicrobial agent. For the sake of convenience, the act of providing the textile material with an active antimicrobial agent, by any means, may herein be thought of more generally as a “step for” providing a textile with an active antimicrobial agent.

[0048] As a step for providing a textile with an active antimicrobial agent, any of the following acts may be performed, and the selection of one or the other may be dictated by some specific of the given situation. For example, the textile may be sprayed or immersed in some kind of fluid containing the active antimicrobial agent, and optionally be allowed to dry or cure. The textile may be stored in a pouch or envelope containing a fluid that has the active antimicrobial agent. The fiber making up the textile may be sprayed or immersed in a fluid containing the active antimicrobial agent, and then the treated fiber may be fabricated into the textile. The material making up the fiber may be treated so as to include the active antimicrobial agent, prior to the fiber being produced, so that when the fiber is produced it already includes the active antimicrobial agent. Other, equivalent approaches to providing a textile with an active antimicrobial agent are acceptable as well.

[0049] Once the step for providing the textile with the active antimicrobial agent is performed, it may be said that the textile carries the active antimicrobial agent.

[0050] It is envisioned that the shoe protection article will be a low cost, disposable article dispensed from a box or roll, or perhaps an envelope or pouch.

[0051] In one non-limiting embodiment, the shoe protection articles may be stored in a moisture-proof container before use in order to prevent evaporation or diminishing of the antimicrobial agent from exposure to heat, light and other elements. The moisture-proof container may also contain an amount of the antimicrobial agent residing within the container in order to maintain an effective amount of the antimicrobial agent on the shoe protection article until use. The container is designed to preserve the life of the shoe protection article and possibly include a dispensing opening that it
suited to easily dispense one or more shoe protection articles without much loss of moisture or the amount of the antimicrobial agent stored inside.

Some active antimicrobial agent types might require such a moisture retaining system to preserve their effectiveness. Other active antimicrobial agent types might not need it.

The shoe protection article, in one embodiment already mentioned, is placed over a shoe tree so that the active antimicrobial agent might be brought into contact with the interior of the shoe. In an alternative embodiment, the shoe protection article might be placed over a wearer’s foot. In such a usage scenario, the active antimicrobial agent should be of the type that poses no potential harm to humans, such as silver dihydrogen citrate for example. If a box of such shoe protection articles were provided, e.g., in a shoe store, shoppers trying on shoes could advantageously put such shoe protection articles on their feet prior to trying on shoes, thereby protecting the shoes’ interior spaces from shoppers’ feet.

Many variations to the above-identified embodiments are possible without departing from the scope and spirit of the invention. Possible variations have been presented throughout the foregoing discussion. Moreover, it will be appreciated that combinations and sub-combinations of the various embodiments described above will occur to those familiar with this field, without departing from the scope and spirit of the invention.

There is claimed:

1. An article intended for protecting the interior of a shoe, comprising:
   a textile formed into a shape approximating essentially a cup; and
   an active antimicrobial agent carried by the textile.
2. The article as set forth in claim 1, wherein the active antimicrobial agent is silver dihydrogen citrate.
3. The article as set forth in claim 1, wherein a rim portion of the cup is gathered.
4. The article as set forth in claim 1, wherein the textile is formed into a shape approximating a toe portion of a shoe tree.
5. The article as set forth in claim 1, wherein the textile is formed into a shape approximating essentially an elongated cup.
6. The article as set forth in claim 1, wherein the textile is formed into a shape approximating a toe portion and a heel portion of a shoe tree.
7. The article as set forth in claim 1, wherein the textile is synthetic.
8. The article as set forth in claim 7, wherein the textile is elastic.
9. The article as set forth in claim 8, wherein the textile is nylon.
10. A method of forming an article for protecting the interior of a shoe, comprising:
    a step for providing a textile with an active antimicrobial agent; and
    forming the textile into a shape approximating essentially a cup.
11. The method as set forth in claim 10, wherein the active antimicrobial agent is silver dihydrogen citrate.
12. The method as set forth in claim 10, further comprising forming a gathered rim portion of the cup.
13. The method as set forth in claim 10, further comprising forming the textile into a shape approximating a toe portion of a shoe tree.
14. The method as set forth in claim 10, further comprising forming the textile into a shape approximating essentially an elongated cup.
15. The method as set forth in claim 10, further comprising forming the textile into a shape approximating a toe portion and a heel portion of a shoe tree.
16. The article as set forth in claim 10, wherein the textile comprises a synthetic textile.
17. The article as set forth in claim 16, wherein the textile comprises an elastic textile.
18. The article as set forth in claim 17, wherein the textile comprises a nylon textile.

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