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(54) ODOR PROTECTOR FOR A SHIN GUARD

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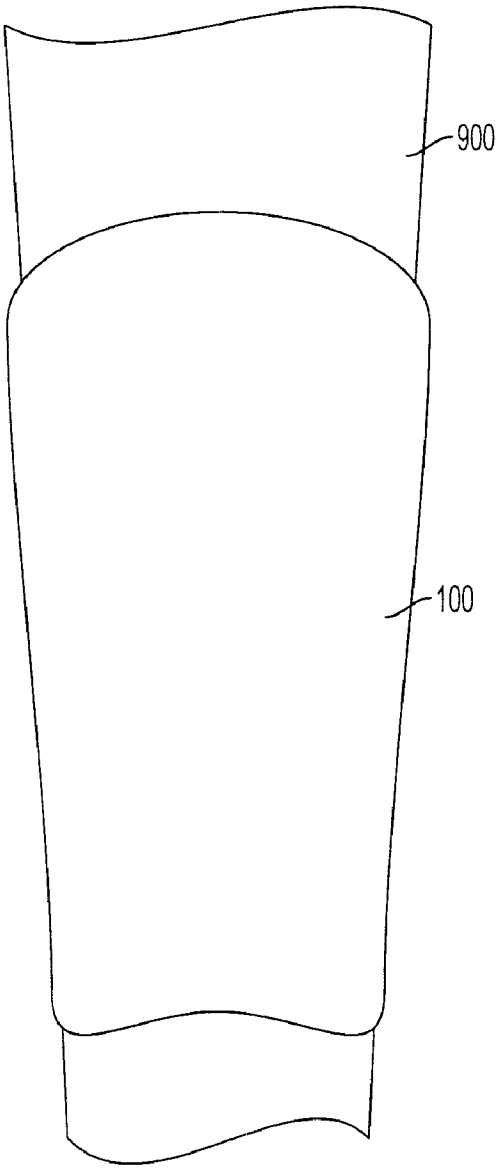
(57) **ABSTRACT**

A shin guard odor protector generally comprised of an absorbent pad, a protective barrier material, and a fastening system designed to be temporarily attached to a shin guard such that it absorbs the wearer's perspiration, protects the shin guard from that perspiration, and is removable and discardable after use.



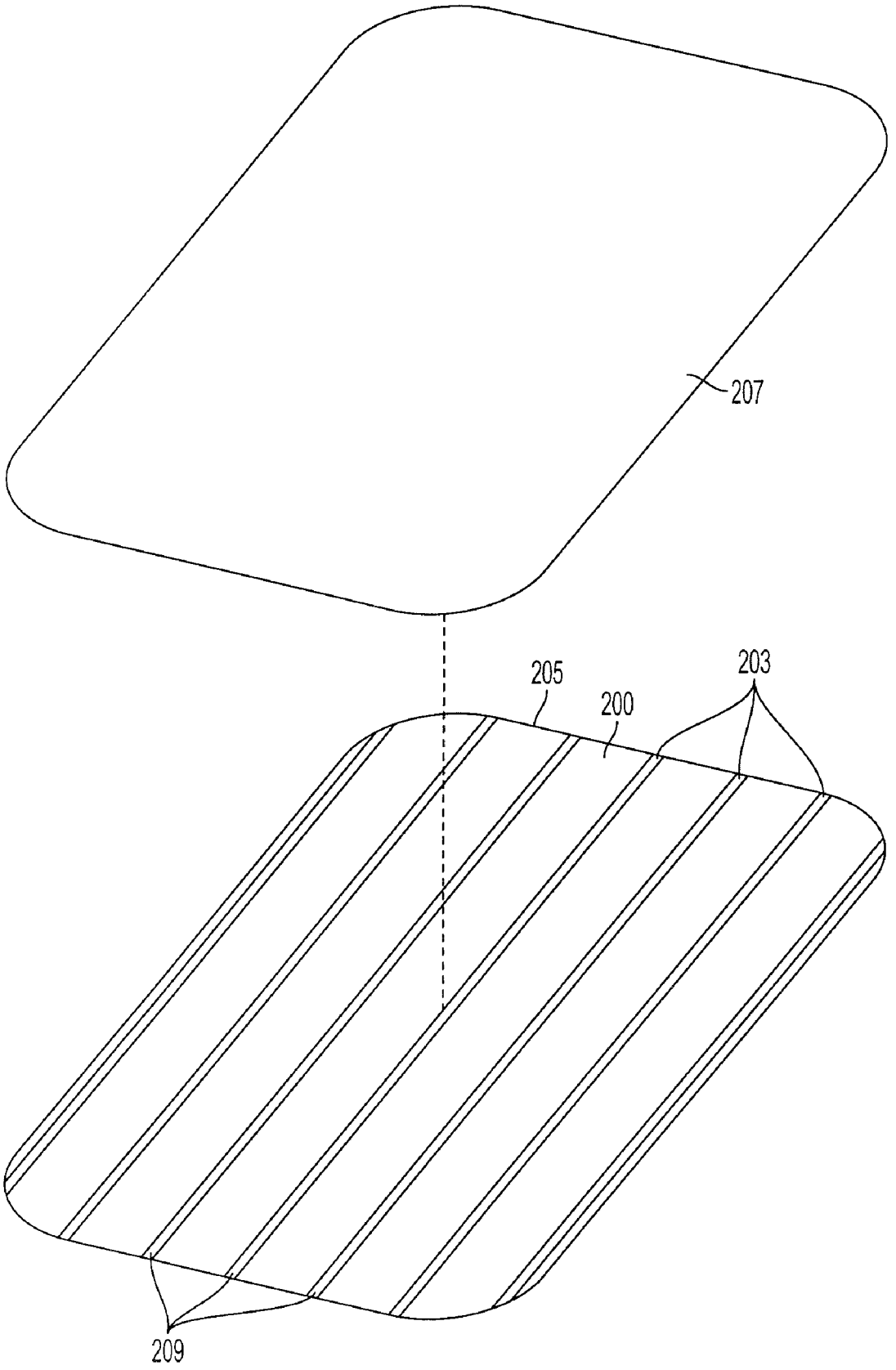


FIG. 1

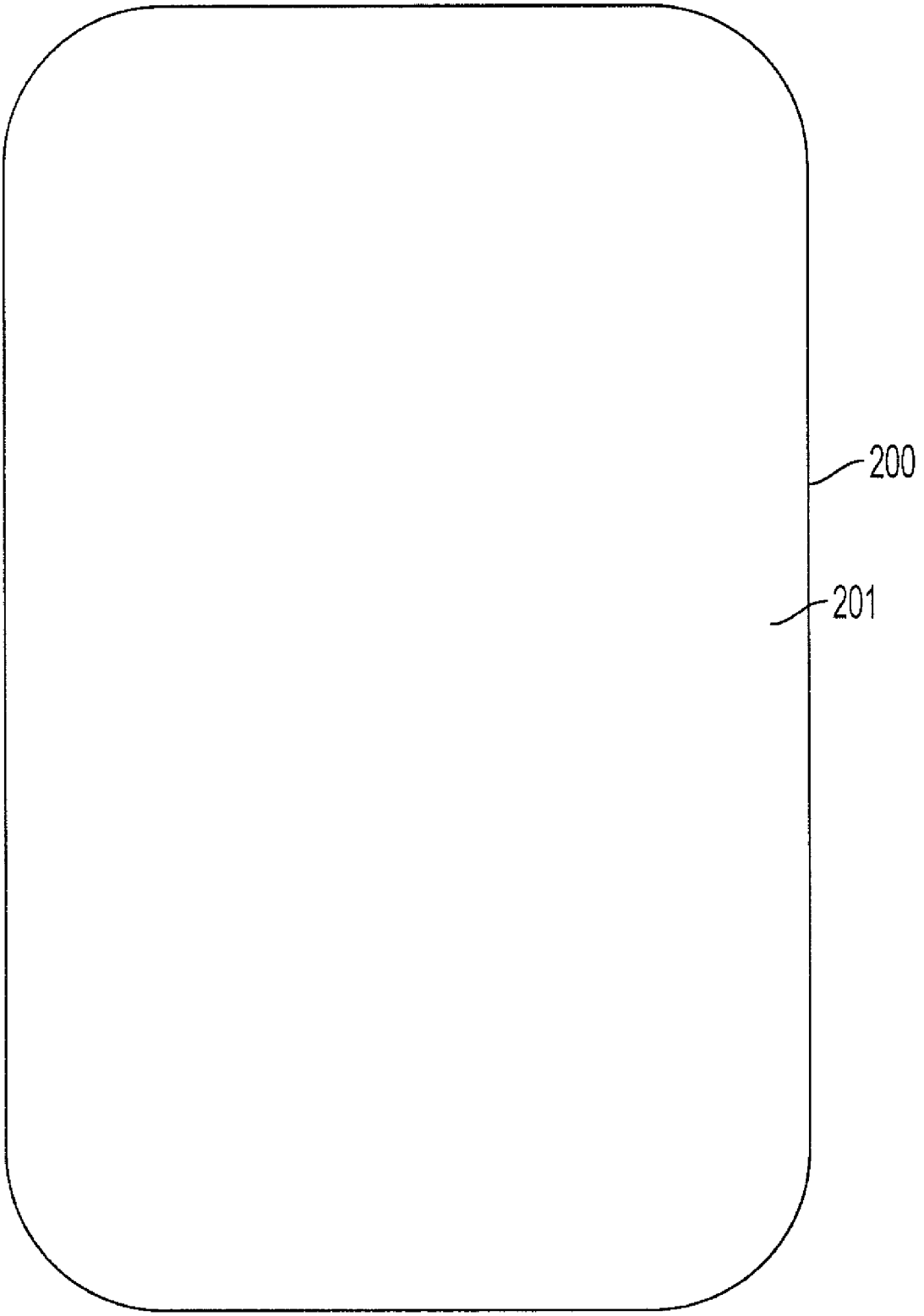


FIG. 2

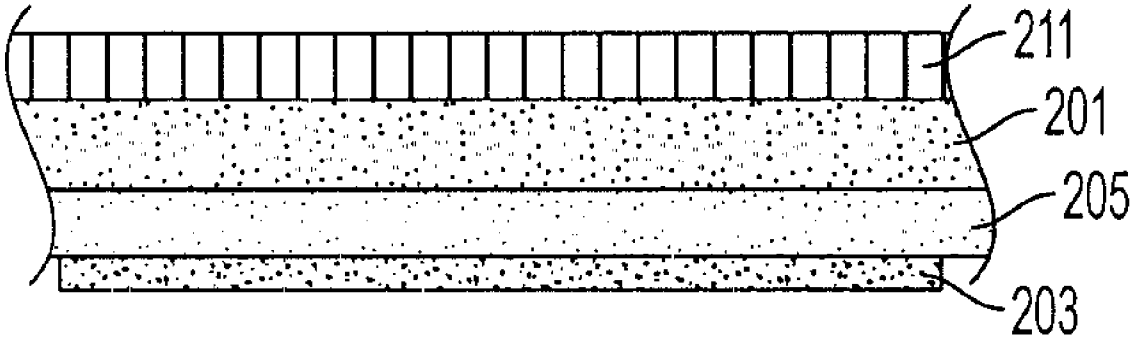


FIG. 3

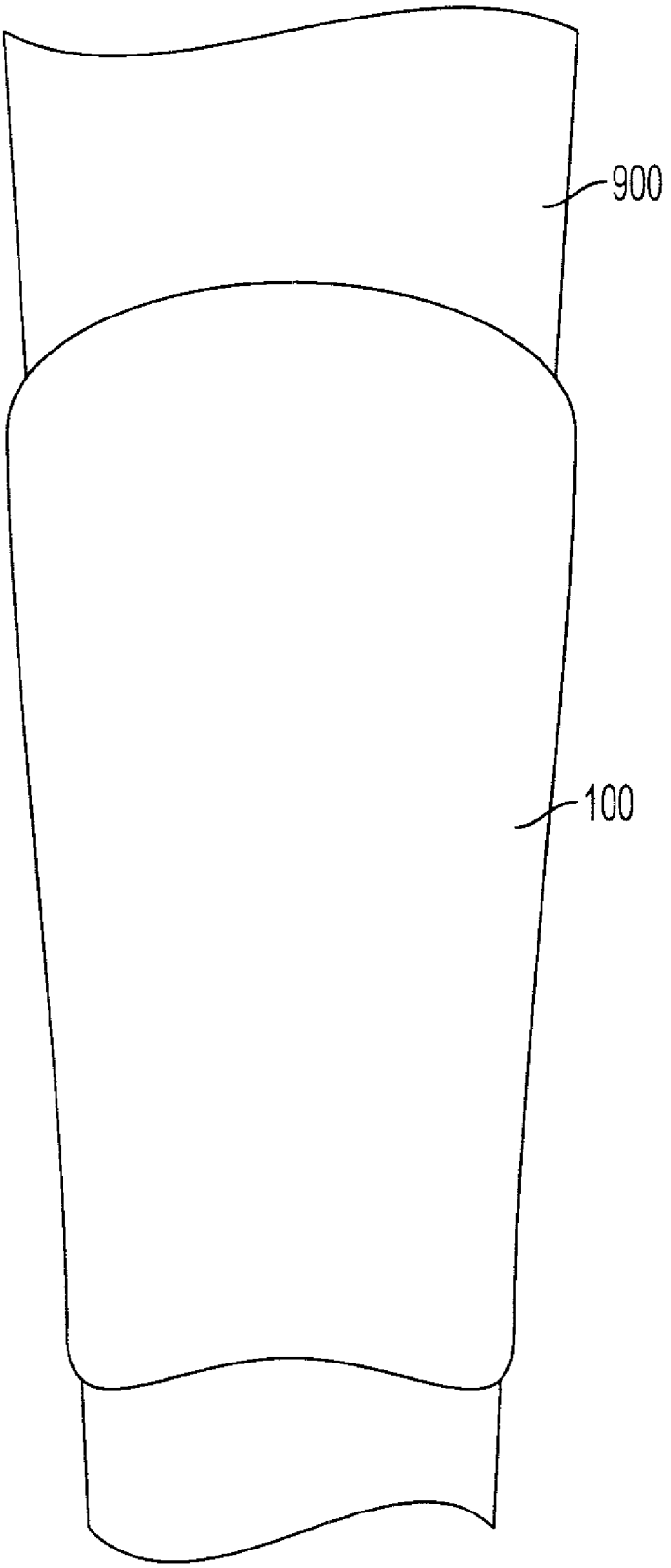


FIG. 4

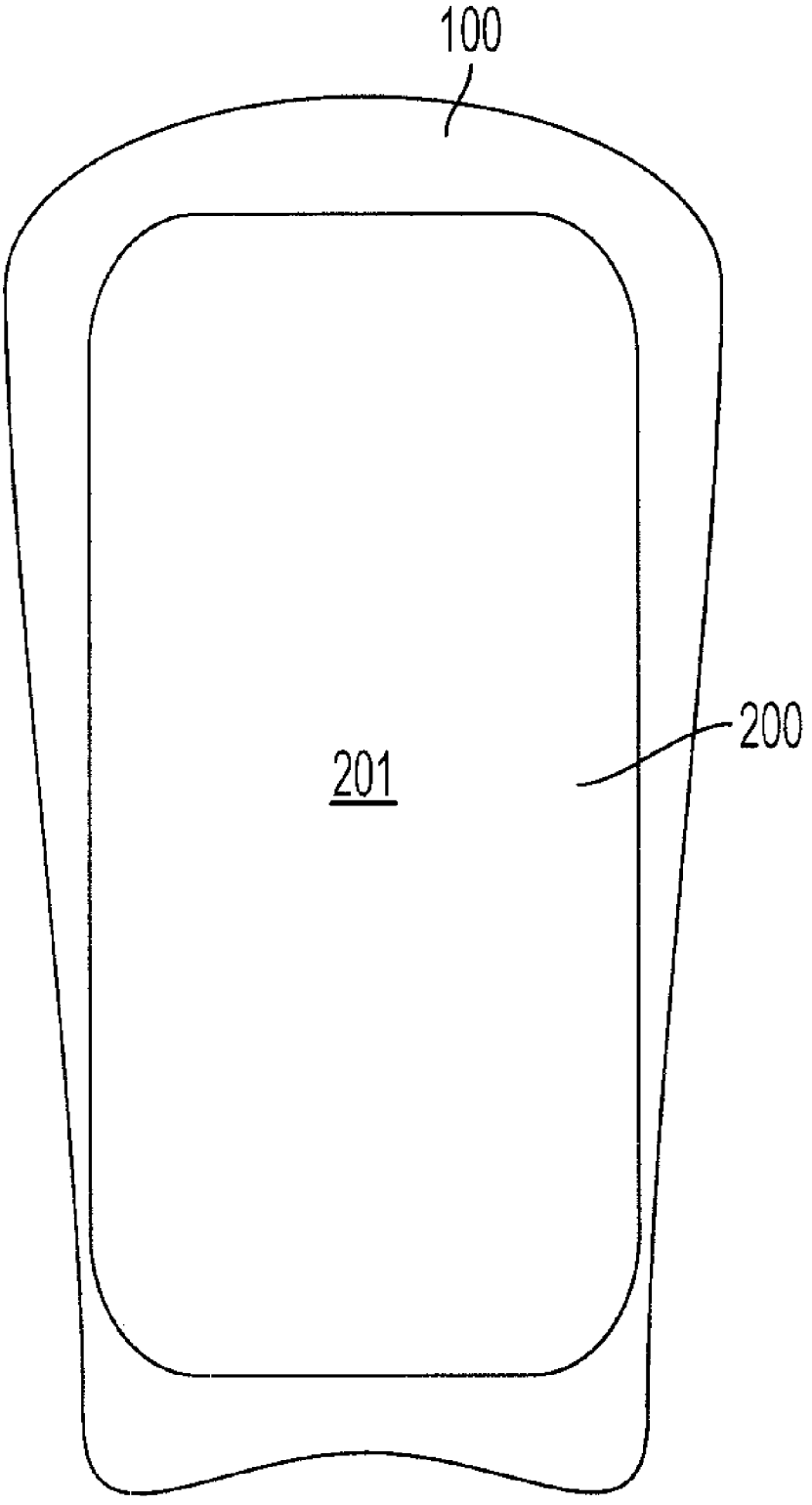


FIG. 5

ODOR PROTECTOR FOR A SHIN GUARD

CROSS REFERENCE TO RELATED APPLICATION(S)

[0001] This application claims benefit of U.S. Provisional Patent Application Ser. No. 60/743,698 filed Mar. 23, 2006.

BACKGROUND

[0002] 1. Field of the Invention

[0003] This disclosure relates to the field of odor protection devices; specifically odor protection devices for use with athletic shin guards.

[0004] 2. Description of the Related Art

[0005] Many athletic activities require the use of shin guards to protect a player, umpire, referee, or other participant from injury from being errantly kicked or hit during a game. For example, shin guards are typically worn by participants in soccer, hockey, field hockey, football, and lacrosse. Further, referees or umpires in these games may also wear shin guards as protection from injury.

[0006] Typically, shin guards are constructed of foams, carbon fiber, high impact plastics or other materials to deflect and protect against blows. This hard resistive material is often encased or backed by lightweight fabric to further cushion blows and improve comfort. Shin guards are generally worn inside a sock or other leg covering and are secured to a user's leg with the use of straps or other fastening device which connect to the leg and/or ankle. This manner of use results in a tight fit between the shin guard and a user's leg with the inside portion of the shin guard coming into direct contact with a user's skin.

[0007] Shin guard users frequently perspire due to physical exertion or environmental conditions while wearing the shin guard during practice or game situations. This perspiration may then be trapped between the user's leg and the shin guard and may permeate the fabric coverings or even the protective layer depending on design. The accumulation of this moisture on the shin guard often results in the growth of bacteria, fungus and mold on the shin guard after repeated use unless the shin guards are carefully cleaned and disinfected after each use.

[0008] Microorganism growth on the shin guard often results in a strong unpleasant odor emanating from the shin guard. Because shin guards are typically worn practice after practice, game after game, the user's shin guards can develop a very distinct and unpleasant odor. This can make the shin guards unpleasant to carry in a confined area such as a vehicle and can cause problematic interactions in other places, such as in a locker or gym bag.

[0009] Currently, in order for users of shin guards to treat the odor, they usually use some type of cleaning agent that may have antibacterial and antifungal properties after use. However, treating the odor may not always be practical and it does not always eliminate it as powders or other cleaning and disinfecting agents may be unable to contact moisture held deep in fabric padding. Further, cleaning currently requires a purposeful action be performed after each use (and generally shortly thereafter) when a user is tired and often desirous of simply getting home. As a result, for some users, when the odor no longer becomes bearable, the user may then have to discard the shin guard and purchase new shin guards.

[0010] Additionally, on some occasions users have to share their shin guards with other users. When multiple parties wear the same shin guards, they put themselves at risk of possible infection due to contamination on the shin guard from a previous user. The shin guard may be exposed to blood or other body fluids of the user which may allow organisms carried by those fluid to be present in the material of the shin guard. Further, one user may find it distinctly unpleasant to use another's shin guards and opt not to use them, exposing themselves to injury. As a result, it is desirable to have protection and isolation structures in shin guards that may be passed from one user to another.

[0011] Thus, currently shin guards have two major problems, odor from the buildup of moisture from the user's perspiration and the possibility of infections being transferred from multiple users. Currently, there is no easy or quick way for users to protect themselves from the odor or the possibility of infection. Sprays and powders used to destroy or kill microorganisms or other material are cumbersome and burdensome to use. Further, these solutions take an extra step and the users must wait until the shin guards are off and apply the solutions and wait for the solutions to take affect. There is no quick or easy way for users to protect their shin guards from either odor or possible user to user contamination while they are in use.

SUMMARY

[0012] The following is a summary of the invention in order to provide a basic understanding of some aspects of the invention. This summary is not intended to identify key or critical elements of the invention or to delineate the scope of the invention. The sole purpose of this section is to present some concepts of the invention in a simplified form as a prelude to the more detailed description that is presented later.

[0013] Described herein, among other things, is an absorbent pad preventing odor buildup in a shin guard, comprising an absorption layer, a barrier layer attached to the absorption layer, and a fastening system attached to the barrier layer, wherein the fastening system is adapted to temporarily fasten the pad to a shin guard such that the pad intercalates between the shin guard and a shin of a user, the absorption layer interfaces with the shin to absorb moisture therefrom, and the pad can remain in place while the shin guard is in use.

[0014] In an embodiment, the pad is shaped as a four-sided polygon. In a further embodiment, the intercalation applies to a majority of an area of the shin guard designed for interfacing with the shin.

[0015] An embodiment comprises an absorption layer constructed of a material capable of storing perspiration of the user. In addition, it may further comprise a surface layer attached to the absorption layer wherein the surface layer is interspersed between the absorption layer and the user. This surface layer and the absorption layer may be continguous and not intended to be separated. In an embodiment, the barrier layer is constructed of a material capable of blocking moisture.

[0016] The fastening system, in an embodiment, comprises adhesive material. The fastening system may further comprise a removable cover for the adhesive material.

[0017] Also described herein is the combination of a shin guard and an absorbent pad, wherein the absorbent pad is

adapted to temporarily fasten to the shin guard and protect the shin guard from moisture originating from a user during a discrete period of time.

[0018] Further describe herein is a method for preventing odor buildup in a shin guard, comprising adhering a pad to a shin guard such that the pad intercalates between the shin guard and a shin of a user, having the user wear the shin guard adhered to the pad for a discrete period of time, and removing the pad from the shin guard.

BRIEF DESCRIPTION OF THE DRAWINGS

[0019] FIG. **1** provides a perspective view of an embodiment of the shin guard odor protector separated from the shin guard and showing the fastening system and protective barrier surface.

[0020] FIG. **2** provides a rear view of the embodiment of FIG. **1**.

[0021] FIG. **3** shows a cross-sectional view of the embodiment of FIG. **2**.

[0022] FIG. **4** provides a front view of an embodiment of a shin guard with an attached odor protector, attached to a leg of a human user shown therein.

[0023] FIG. **5** provides a view of an embodiment of the shin guard odor protector attached to a shin guard.

DESCRIPTION OF PREFERRED EMBODIMENT(S)

[0024] Because of these and other problems in the art, described herein is a shin guard odor protector (**200**) designed specifically to prevent odor buildup from shin guard use and which may reduce the risk of infection present with multiple shin guard users. The odor protector (**200**) is designed to be integrated with the shin guard (**100**) while it is in use and is easily discarded after use.

[0025] The shin guard odor protector (**200**) generally is in the form of a pad or other design which is attached to the inside portion of a user's shin guard (**100**) called the "rear" of the shin guard (**100**) so as to place the shin guard odor protector (**200**) into contact with a user's skin and provide a protective barrier between a user and the shin guard (**100**) surfaces. The shin guard odor protector (**200**) is generally comprised of three parts which are connected together to form a cohesive structure.

[0026] This structure is then temporarily attached to the inside of the shin guard (**100**) while the shin guard (**100**) is in use, and is removed and discarded once the shin guards are taken off. In an embodiment, the shin guard includes three layers which are in order from back to front an absorbent pad (**201**) which contacts with a user's skin, a protective barrier material (**205**) which prevents any moisture or other contaminant from reaching the shin guard (**100**) itself, and a fastening system (**203**) which allows the shin guard odor protector (**200**) to be temporarily attached to the inside portion of the shin guard (**100**).

[0027] The terms "front" and "rear" as used herein when referring to the shin guard odor protector (**200**) are chosen arbitrarily but are used to refer to the shin guard (**100**) side of the device and the leg side of the device respectively. That is, orientations of the shin guard odor protector (**200**) are generally the same as for a user wearing the shin guard (**100**).

[0028] An embodiment of the shin guard odor protector (**200**) is shown in FIGS. **1** and **2**. The shin guard odor protector (**200**) in this embodiment generally comprises an absorbent pad (**201**) that will be in direct contact with a user's skin and comprises most of the shin guard odor protector (**200**), a protective barrier surface (**205**) designed to protect the inside of the shin guard (**100**) surface from contamination, and a fastening system (**203**) that is attached to the protective barrier surface (**205**) and provides a mechanism for attaching the shin guard odor protector (**200**) to the inside surface of a user's shin guard (**100**).

[0029] Generally, the shin guard odor protector (**200**) will be shaped to provide a major surface formed as a generally four-sided polygon, however such shape is by no means required. In the depicted embodiment, the shin guard odor protector (**200**) is generally rectangular with the horizontal length shorter than the vertical length. The rectangular design is usually preferred as it will give maximum protection for most shin guard (**100**) designs by placing the largest surface area against the user's leg (**900**) and covers a substantial portion of the inner surface of the shin guard (**100**). In order to fit the odor protector (**200**) with most types of shin guards it is generally preferable to have them be provided in multiple sizes. These sizes can include about 4.5 by about 6.5 inch rectangles or about 5 by about 8.5 inch rectangles to correspond to common shin guard sizes. However, it should be recognized that the odor protector (**200**) may be of any shape and will generally be sized and shaped so as to fill most of the area of the inside surface of the shin guard (**100**) as shown in FIG. **5**.

[0030] In the depicted embodiment of FIGS. **1** and **2**, the shin guard odor protector (**200**) comprises two materials which are adhered together with an attached fastening system (**203**) to connect the odor protector (**200**) to the shin guard. The rearward material comprises the absorbent pad (**201**). In this embodiment, the shin guard odor protector (**200**) makes contact with a user's skin via the absorbent pad (**201**). The absorbent pad (**201**) may be constructed of any material designed to absorb perspiration from the user by being in contact with a user's skin. Generally, the absorbent pad will comprise a fiber based cloth, batting, or similar material that is capable of efficient wicking or similar capillary action with regards to water. The absorbent pad (**201**) will wick moisture from the user's leg and generally trap it in the absorbent pad (**201**).

[0031] By absorbing and storing a user's perspiration, the absorbent pad (**201**) will generally inhibit moisture from contacting the shin guard (**100**) and therefore inhibit odor causing or infectious material being present on the shin guard (**100**). In a preferred embodiment the absorbent pad (**201**) will be made of a synthetic or natural cloth material with absorption capabilities preferably between 1/16 of an inch and 1/8 of an inch thick. The material may comprise a single layer of material or multiple layers used in combination. In an embodiment the material comprising the absorbent pad (**201**) may be hypoallergenic in order to prevent users from reacting to the absorbent pad (**201**). In a further embodiment, the absorbent pad (**201**) will be comprised of any combination of natural and synthetic materials. The absorbent pad (**201**) may also, in an embodiment, be impregnated with other materials such as powdered substances. These may serve to further trap moisture, to provide antimicrobial function, to provide a particular scent, or any combination of these things.

[0032] It is generally preferred that the absorbent pad (**201**) be soft and pliable to the touch and generally non-

irritating to the skin. As the odor protector (**200**) will remain in place while the shin guard (**100**) is in use, the absorbent pad (**201**) needs to be sufficiently pliable that when the shin guard (**100**) is contacted by play (such as by being kicked) the absorbent pad (**201**) does not present a danger to the wearer. Further, as the absorbent pad (**201**) will remain in contact with the user for a reasonably long period of time, it is desirable that the absorbent pad (**201**) not be abrasive or adhere to the skin even when wet. As shown in the embodiment of FIG. **3**, it can therefore include a surface layer (**211**) which is porous but generally nonabsorbent which acts as a barrier between the absorbent pad (**200**) and the user's leg (**900**).

[0033] The shin guard (**100**) will generally be fastened to a user's leg (**900**) with some type of connector (not shown) such as elastic or other straps. This connector allows the shin guard (**100**) to remain on a user's leg (**900**) during the time it is needed and will cause the absorbent pad (**201**) of the shin guard odor protector (**200**) to be held in direct contact with a user's leg (**900**) when the user is wearing the shin guard (**100**). Because of this direct contact, the absorbent pad (**201**) will absorb and trap perspiration and in conjunction with the protective barrier (**205**), preventing any moisture from coming into contact with the shin guard (**100**) as well as preventing any infectious material from contacting the shin guard (**100**) directly.

[0034] While the absorbent pad (**201**) will serve to wick moisture away from the user's leg (**900**), in order to protect the inside surface of the shin guard (**100**) from coming in contact with moisture in the absorbent pad (**201**), the shin guard odor protector (**200**) will generally have a protective barrier (**205**) on the front surface of the shin guard odor protector (**200**) to separate the shin guard (**100**) from the absorbent pad (**201**). In preferred embodiments the protective barrier (**205**) will be attached to the absorbent pad (**201**) with a bonding adhesive or may be sewn or co-formed with the absorbent pad (**201**). In a still further embodiment, the protective barrier may comprise a laminate placed on the absorbent pad (**201**), or may be attached to the absorbent pad (**201**) using other chemical or mechanical methods known to one of ordinary skill in the art. In still further embodiments, the protective barrier (**205**) may attach to the absorbent pad (**201**) through another layer of material. This material may be differently absorbent to the absorbent pad (**201**) and/or protective barrier (**205**) to provide a further level of absorption and inhibition.

[0035] The protective barrier (**205**) is generally designed to prevent moisture and other contaminants which may be carried by the moisture from reaching the inside surface of the shin guard (**100**) though the absorbent pad (**201**). By providing this barrier, moisture or infectious materials will generally not be able to contact the shin guard (**100**) directly and thus no odor or infection risks will be present on the material of the shin guard (**100**). The protective barrier (**205**) will generally be of similar area to the absorbent pad (**201**) so as to be between the entire surface area of the absorbent pad (**201**) and the shin guard (**100**) and assist to form the shape of the shin guard odor protector (**200**).

[0036] By insuring the protective barrier (**205**) covers the entire surface area of the front of the absorbent pad (**201**), the protective barrier (**205**) will supply the shin guard odor protector (**200**) with desirable odor and infection reduction capability as only negligible moisture retained in the absorbent pad (**201**) can pass through the absorbent pad (**201**) and contact the shin guard (**100**). The protective barrier (**205**) will generally be made out of a plastic type material which has moisture blocking properties. In one embodiment thin, generally non-porous plastic sheeting such as cellophane is used.

[0037] On the front surface of the protective barrier surface (**205**) opposing the absorbent pad (**201**) there will generally be a fastening system (**203**) attached. This is shown best in FIG. **1**. In an embodiment, the fastening system (**203**) will comprise strips of adhesive material (**209**) that are individually or collectively covered by a removable cover (**207**) prior to the shin guard odor protector (**200**) being used. The removable cover (**207**) is designed to stay on the adhesive of the fastening system (**203**) until the shin guard odor protector (**200**) is to be used.

[0038] When the shin guard odor protector (**200**) is to be used, the user will remove and discard the removable cover (**207**). The user will then press the exposed adhesive against the inside of the shin guard (**100**) to fasten the shin guard odor protector (**200**) to the desired location inside the shin guard (**100**). This will then place the odor protector (**200**) in proximity with the inside of the shin guard (**100**) as shown in FIG. **5**. The odor protector (**200**) is therefore not visible when the shin guard (**100**) is worn as is shown in FIG. **4**. When the user has completed the athletic activity, the shin guard (**100**) is removed from their leg and the odor protector (**200**) is then separated from the shin guard (**100**) by breaking the seal of the adhesive. Preferably, the seal is broken between the adhesive strip (**209**) and the shin guard (**100**) so that the adhesive remains on the odor protector (**200**) and separates cleanly from the shin guard (**100**) but this is not required. A clean separation inhibits damage from use of the odor protectors (**200**) repeatedly with the same shin guards. For this reason it is generally preferred that the adhesive be sufficiently strong to resist accidental separation while sufficiently weak to be separated by hand. In an embodiment the adhesive adheres with less than 5 lb/ft^2 of force. Further, in an embodiment the adhesive strip (**209**) is attached to the protective barrier (**205**) with a stronger adhesive force than it is attached to the shin guard (**100**).

[0039] In alternative embodiments the fastening system (**203**) may consist of a hook and loop type fastener (Velcro™), snap type fasteners, or other mechanical fastening systems known to those of ordinary skill. In still further embodiments, the fastening system (**203**) may consist of any other type of chemical, mechanical or other mode of fastening suitable to temporarily attach the odor protector to the shin guard. In a still further embodiment, the fastening system (**203**) is designed to specifically fit a shin guard (**100**). For example, the shin guard (**100**) may contain the male part of the fastener and the shin guard odor protector (**200**) may contain the female part of the fastener (or vice versa) which interconnect in a locking type of arrangement.

[0040] Regardless of how the odor protector is attached to the shin guard, once separated, the odor protector (**200**) is discarded as waste by the shin guard user. As the moisture from the athletic activity is generally retained in the absorbent pad (**201**) at the time of disposal. Immediate disposal of the odor protector (**200**) allows the user to carry their shin guards (**100**) in a vehicle, or store them in a confined space even immediately after use without concern that they will generate an unpleasant odor. Further, as a different set of odor protectors (**200**) can be used for each user on shared

shin guards, a later user is less likely to be exposed to infectious agents from the first user.

[0041] The odor protectors (**200**) may be provided singly or as multiples packaged together. The latter is generally preferable as it allows for spares in the event that they are needed and can also provide for a sufficient number that a new odor protector (**200**) can always be used by players even when they cannot obtain additional packages between games.

[0042] While the invention has been disclosed in connection with certain preferred embodiments, this should not be taken as a limitation to all of the provided details. Modifications and variations of the described embodiments may be made without departing from the spirit and scope of the invention, and other embodiments should be understood to be encompassed in the present disclosure as would be understood by those of ordinary skill in the art.

1. An absorbent pad preventing odor buildup in a shin guard, comprising:
- an absorption layer;
- a barrier layer attached to said absorption layer;
- and a fastening system attached to said barrier layer;
- wherein said fastening system is adapted to temporarily fasten said pad to a shin guard such that:
  - said pad intercalates between said shin guard and a shin of a user;
  - said absorption layer interfaces with said shin to absorb moisture therefrom; and
  - said pad can remain in place while said shin guard is in use.

2. The apparatus of claim **1** wherein said pad is shaped as a four-sided polygon.

3. The apparatus of claim **1** wherein said intercalation applies to a majority of an area of said shin guard designed for interfacing with said shin.

4. The apparatus of claim **1** wherein said absorption layer is constructed of a material capable of storing perspiration of said user.

5. The apparatus of claim **1** further comprising a surface layer attached to said absorption layer wherein said surface layer is interspersed between said absorption layer and said user.

6. The apparatus of claim **5** wherein said surface layer and said absorption layer are continguous and not intended to be separated.

7. The apparatus of claim **1** wherein said barrier layer is constructed of a material capable of blocking moisture.

8. The apparatus of claim **1** wherein said fastening system comprises adhesive material.

9. The apparatus of claim **9** wherein said fastening system further comprises a removable cover for said adhesive material

10. A combination of a shin guard and an absorbent pad, wherein said absorbent pad comprises:
- an absorption layer;
- a barrier layer attached to said absorption layer;
- and a fastening system attached to said barrier layer;
- wherein said fastening system is adapted to temporarily fasten said pad to a shin guard such that:
  - said pad intercalates between said shin guard and a shin of a user;
  - said absorption layer interfaces with said shin to absorb moisture therefrom; and
  - said pad can remain in place while said shin guard is in use.

11. A method for preventing odor buildup in a shin guard, comprising:
- adhering a pad to a shin guard such that said pad intercalates between said shin guard and a shin of a user;
- having said user wear said shin guard adhered to said pad for a discrete period of time; and
- removing said pad from said shin guard.

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