ODOR ABSORBING SYSTEMS AND METHODS

Inventor: Anthony E. Newman, Shakopee, MN (US)

Correspondence Address:
WESTMAN CHAMPLIN & KELLY, P.A.
SUITE 1400
900 SECOND AVENUE SOUTH
MINNEAPOLIS, MN 55402-3319 (US)

Appl. No.: 11/685,512
Filed: Mar. 13, 2007

Related U.S. Application Data
Continuation-in-part of application No. 11/024,510, filed on Dec. 29, 2004.

Provisional application No. 60/861,372, filed on Nov. 28, 2006.

Publication Classification
Int. Cl. B65D 85/18 (2006.01)
U.S. Cl. .................................................. 206/278

ABSTRACT
An odor absorbing system for use by a person to reduce odor emanation from the person into an environment surrounding the person. The system includes a container having a substantially airtight interior chamber and an odor absorbing insert stored in the interior chamber. The insert includes a layer of breathable material and an odor absorbing agent on the layer of breathable material. The insert is configured for removable attachment to the article of clothing adjacent the vent.
104 Container
106 Odor Absorbing Material

FIG. 1
FIG. 2

1. PROVIDE AN ODOR ABSORBING MATERIAL
2. STORE THE ODOR ABSORBING MATERIAL IN A CONTAINER
3. REMOVE THE ODOR ABSORBING MATERIAL FROM THE CONTAINER
4. WEAR THE ODOR ABSORBING MATERIAL

FIG. 3A
Provide an odor absorbing insert in a container

Remove the insert from the container

Attach the insert to an article of clothing and wearing the article of clothing

Remove the insert from the article of clothing

Store the insert in the container and sealing the container
1. CREATE AN ODOR ABSORBING MATERIAL
2. STORE THE ODOR ABSORBING MATERIAL IN A CONTAINER
3. TRANSPORT THE MATERIAL IN THE CONTAINER TO A SECONDARY LOCATION

FIG. 12A

FIG. 12B
ODOR ABSORBING SYSTEMS AND METHODS

[0001] The present application is based on and claims the benefit of U.S. provisional patent application Ser. No. 60/861,372, filed Nov. 28, 2006; and this application is a Continuation-in-Part of U.S. patent application Ser. No. 11/024,510, entitled “ODOR ABSORBING SYSTEM AND METHOD,” filed Dec. 29, 2004. The contents of the above-identified applications are hereby incorporated by reference in their entirety.

FIELD OF THE INVENTION

[0002] The present invention generally relates to an odor absorbing system configured to reduce odor emanation from a person into an environment surrounding the person and, more particularly, to an odor absorbing system that maintains its odor absorbing capabilities during periods of non-use.

BACKGROUND OF THE INVENTION

[0003] Outdoorsmen and women, particularly hunters, often take steps to prevent their detection by wildlife. Such steps include making themselves less visibly detectable to wildlife by, for example, hiding in a tree-stand or wearing camouflaging clothing.

[0004] Such wildlife detection preventing methods also include reducing the likelihood of being detected by scent. For example, animals positioned downwind of the person can easily smell bodily odors including natural body secretions. Other bodily odors that are detectable by animals include odors resulting from soaps, perfumes, shampoos, deodorants and other products that are applied to the body. Other strong animal-detectable odors include those embedded in our clothes that are acquired from the environment, such as cigarette smoke, odors from a cleaning detergent or fabric softener applied to the clothes when washed, and other odors.

[0005] Articles of clothing have been developed to prevent odor emanation from the person wearing the article of clothing. Examples of such articles of clothing are described in U.S. Pat. Nos. 5,383,236, 5,539,930, 5,790,987, 6,009,559 and 6,134,718 (hereinafter “Sesselmann patents”). Briefly, the patents describe articles of clothing that are formed of a base layer on which a scent absorbing means is “provided” by bonding a scent absorbing agent to a surface of the base layer through a silk-screen printing process.

[0006] The rate at which the odor absorbing materials (e.g., activated carbon and/or charcoal) absorb odors decreases with exposure to odors to a point where are no longer useful for scent absorbing purposes. Further, exposure of the odor absorbing materials to odors can take place from the moment the odor absorbing material is formed. As a result, the scent absorbing capability of the odor absorbing material decreases not only during use (i.e., while being worn), but also during periods of non-use, such as during manufacture of the product, transportation of the product, and while the product is being stored.

[0007] Further, these problems have been exacerbated by the erroneous belief that some odor absorbing materials, such as those using activated carbon, have odor absorbing properties that can be renewed by washing and drying the material. For example, the Sesselmann patents incorrectly claim that when the scent absorbing means is activated charcoal, it may be reactivated merely by machine washing and drying the article of clothing. Instead, reactivation of activated charcoal requires a much more complicated process that cannot be performed by washing or drying machines. The one traditional way to “reactivate” activated charcoal is through a process called pyrolysis in which the activated charcoal is heated to over 1400° F. (800° C.) in a controlled atmosphere of low oxygen. Accordingly, the useful scent absorbing lifespan of the activated charcoal is limited and basically non-renewable to the average consumer. As a result, the entire scent absorbing clothing described in the Sesselmann patents must periodically be replaced in order to maintain the desired scent absorbing performance.

[0008] One result of this erroneous belief that some odor absorbing material can be renewed is that odor absorbing materials, and clothes formed of the odor absorbing materials, have been shipped from manufacturing plants to distributors/retailers and stored in packaging that exposes the odor absorbing material to odors. Additionally, the clothes with the odor absorbing material have been exposed to odors in retail stores where they are simply hung on hangers without taking steps to seal the clothes and the odor absorbing materials in an airtight or substantially airtight container. Further, once purchased by the consumer, the odor absorbing materials continue to absorb odors during transport and during periods of non-use (i.e., storage). The instructions for clothes containing odor absorbing materials, particularly those using activated carbon, have indicated that limiting exposure of the product from odors is unnecessary because the odor absorbing capability of the odor absorbing material in the clothes can be renewed or reactivated by washing the clothes and drying them in a dryer.

[0009] Further, the odor absorbing capabilities and lifespan of the odor absorbing materials, and clothes comprising the odor absorbing materials, is often unknown to consumers of the products. For instance, a prospective purchaser of odor absorbing clothing products does not know the quantity nor the amount of time that the product has been exposed to odors since the product was manufactured. Thus, consumers are forced to make purchasing decisions without knowing the odor absorbing lifespan and properties of the odor absorbing material and product.

[0010] Unless the odor absorbing material is protected from exposure to air and odors, its odor absorbing capability will begin to diminish immediately after it is formed. Therefore, a continuing need exists for ways to provide and store odor absorbing materials and clothes comprising odor absorbing materials to prevent undesired odor absorption during periods of transport, storage, and other non-use.

SUMMARY OF THE INVENTION

[0011] Embodiments of the present invention relate to an odor absorbing system for use by a person to reduce odor emanation from the person into an environment surrounding the person and a method of reducing odor emanation from the person into an environment surrounding the person. One embodiment of the system includes a container having a substantially airtight interior chamber and an odor absorbing insert stored in the interior chamber. The insert includes a layer of breathable material and an odor absorbing agent on
the layer of breathable material. The insert is configured for removable attachment to the article of clothing adjacent the vent.

[0012] In one embodiment of the method, an odor absorbing material comprising carbon is provided and stored in an interior chamber of a substantially airtight container. The odor absorbing material is then removed from the container and worn on the person.

[0013] Other features and benefits that characterize embodiments of the present invention will be apparent upon reading the following detailed description and review of the associated drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0014] FIG. 1 is a block diagram illustrating an odor absorbing hunting system.

[0015] FIG. 2 is a flowchart of a method to reduce odor emanation from a person into an environment surrounding the person, in accordance with embodiments of the invention.

[0016] FIGS. 3A-3C are cross-sectional views of exemplary odor absorbing materials, in accordance with embodiments of the invention.

[0017] FIG. 4 illustrates a container for storing an odor absorbing material, in accordance with embodiments of the invention.

[0018] FIG. 5 illustrates a container configured to accommodate an article of clothing, in accordance with embodiments of the invention.

[0019] FIG. 6 illustrates the container of FIG. 5 with integrated odor absorbing material, in accordance with embodiments of the invention.

[0020] FIG. 7 is a plan view of a scent absorbing insert, in accordance with embodiments of the invention.

[0021] FIGS. 8A and 8B are plan and cross-sectional views of an odor absorbing system utilizing an odor absorbing insert, in accordance with embodiments of the invention.

[0022] FIGS. 9A and 9B are plan and cross-sectional views of an odor absorbing system utilizing an odor absorbing insert, in accordance with embodiments of the invention.

[0023] FIG. 10 illustrates a scent absorbing system comprising an article of clothing adapted to utilize at least one scent absorbing insert, in accordance with embodiments of the invention.

[0024] FIG. 11 is a flow chart of a method of utilizing an odor absorbing system, in accordance with embodiments of the invention.

[0025] FIGS. 12A and 12B illustrate a network and method of manufacturing and distributing odor absorbing materials and products, in accordance with embodiments of the invention.

[0026] FIG. 13 illustrates an odor controlled environment for manufacturing odor absorbing materials and products, in accordance with embodiments of the invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0027] Embodiments of the invention are based on a recognition that odor absorbing materials have a limited useful odor absorbing life span. As discussed above, exposure of the odor absorbing material to odors can take place from the moment the odor absorbing material is formed. Thus, unless the odor absorbing material is protected from exposure to air and odors, its odor absorbing capability will begin to diminish immediately after it is formed.

System and Method of Reducing Odor Emanation from a Person

[0028] One embodiment of the invention relates to an odor absorbing hunting system 100, illustrated in FIG. 1, that comprises an article of clothing 102 for hunting, a container 104 having a substantially airtight interior chamber 106, and an odor absorbing material 108 stored in the interior chamber 106 of the container 104. The odor absorbing material 108, which is also illustrated in phantom with the article of clothing 102, is configured for use with the article of clothing 102 to absorb odors emanating from a person wearing the article of clothing 102. Embodiments of the article of clothing for hunting (hereinafter "clothing"), the container and the odor absorbing material will be described below. Embodiments of the invention include the various possible combinations of the embodiments of these elements.

[0029] FIG. 2 illustrates one embodiment of a method for reducing odor emanation from a person into an environment surrounding the person using the system 100. The method 200 includes a step 202 wherein an odor absorbing material 108 is provided. The odor absorbing material 108 is stored in an interior chamber 106 of a substantially airtight container 104 at step 204. Next, at step 206, the odor absorbing material 108 is removed from the container 104. Finally, the odor absorbing material 108 is worn at step 208. In one embodiment, the odor absorbing material is worn during hunting of wild game. Embodiments of the method in relation to the various embodiments of the system will be described below.

Embodiments of the Odor Absorbing Material

[0030] The odor absorbing material 108 of the system 100 is generally configured for use with the clothing 102, which is worn by a person, or for placement next to the person. The odor absorbing material 108 operates to absorb or adsorb odors emanating from the person wearing the clothing 102 to thereby prevent the odors from entering the environment surrounding the person. Herein, the term "absorb" is used to describe both absorbing and adsorbing functions.

[0031] FIG. 3A illustrates one embodiment of the odor absorbing material 108, that includes a base layer of material 301, which allows an airflow 302 to pass through the material 108. In one embodiment, the base layer 301 is formed of a breathable (e.g., porous) material that allows air to pass through the material 108 without substantial obstruction. Exemplary embodiments of the base layer 301 include mesh, cotton, polypropylene, wool, polyester, or other porous or fibrous fabric or material. The odor absorbing material 108 also includes an odor absorbing agent that is adapted to absorb at least a portion of the odors in the airflow 302 passing through the material 108.
In accordance with one embodiment, the odor absorbing agent 304 is bonded to a surface of the base layer 301, as illustrated in FIG. 3B.

In another embodiment illustrated in FIG. 3C, the base layer 301 of the odor absorbing material 108 comprises a porous material such as those described above. Additionally, base layer 301 may be formed of a fibrous material having a plurality of fibers 306 (shown in the enlarged cross section 305). The fibers may be woven or non-woven. In one embodiment, the odor absorbing agent 304, as illustrated, comprises a plurality of particles embedded within or on the fibers 306.

One embodiment of the odor absorbing agent 304 includes activated carbon or charcoal. In alternative embodiments, the odor absorbing agent can be formed of other known odor absorbing materials, such as chlorophyll, baking soda, activated alumini, soda, lime, zeolite, calcium oxide, potassium permanganate, and cyclodextrin.

Embodiments of the Container

The container 104 of the system 100 is generally configured to store the odor absorbing material 108 in an interior chamber 106 of the container enabling the odor absorbing material 108 to maintain its odor absorbing properties over longer periods of time as compared to prior art articles of clothing that are generally continuously exposed to environmental odors (even when stored during periods of nonuse). Thus, embodiments of the container 104 of the system 100 can extend the useful odor absorbing lifespan of the odor absorbing materials 108.

Some embodiments of the container 104 include sealed containers that can be resealed (e.g., containers with lids and resealable bags) and containers that are not configured to be resealed (e.g., sealed packaging that is torn to open). Further, the container 104 can be made of any suitable material such as plastics, metals, foils, and the like. Additionally, the materials used to form the container 104 can be rigid or semi-rigid, or malleable. In one embodiment, the material forming the container 104 includes materials that are significantly non-permeable (i.e., do not allow liquid or gases to pass through) and have a low odor production. In another embodiment, the container 104 can be formed of a clear material or a sufficiently transparent material as to allow one to see the contents of the container. In another embodiment, the material forming the container 104 is opaque to prevent or reduce the exposure of the odor absorbing material 108 or product formed of the odor absorbing material 108 to light.

In one embodiment, the container 104 comprises a sealable bag 400, as illustrated in FIG. 4. The interior chamber 106 of the container 104 is configured to store an odor absorbing material 108 or product comprising odor absorbing material 108. A seal 406 is configured to close an opening in the container 104 for accessing the interior chamber 106. When sealed, the container 104 substantially prevents odors present in an environment exterior to the container 104 from reaching, and being absorbed by, the odor absorbing material 108. In one embodiment, the seal 406 is reusable allowing the user of the system to place the odor absorbing material 108 in the interior chamber 106 and reseal the container 104 during periods of nonuse. Alternatively, the container 104 can be configured such that the seal 406 is not reusable (i.e., the container 104 is torn to open). Further, the container 104 can include a hanger 408 (for instance, an aperture) for hanging the container on a hook, clothing hanger, or the like.

Another embodiment of the container 104 is sized to receive the article of clothing 102, as illustrated in FIG. 5. The bag 500 is sized to accommodate embodiments of the article of clothing 102. In one embodiment, the bag 500 includes an integral hanger 506 on which the article of clothing 102 can be supported within an interior chamber 106 of the bag 500. The hanger 506 can include a hook, a loop, or any other means that extends into the interior chamber 106 of the bag 500. The hanger 506 is adapted to engage a hanger 504 on which the article of clothing 102 is hung. However, unlike conventional garment bags in which the hanger supporting the garment extends outside of the garment bag, this embodiment of a container 104 allows the garment 102 to be hung from within the interior chamber 106 of the bag 500 while maintaining the odor sealing capabilities of the bag 500.

In one embodiment, the bag 500 includes an integral hook 508 that allows the bag 500 to be attached to an object that is outside of the interior chamber 106, such as a bar. In one example, the hook or loop 508 that extends from the exterior of the bag is adapted to receive a separate hanger to facilitate hanging the bag on a clothes rack.

In one embodiment, the bag 500 includes a reinforced portion 510 configured to connect the hook 506 and/or the hanger 508 to the bag 500. In one example, the reinforced portion 510 has an enlarged surface area for distributing forces exerted by hangers 506 and 508 to a surface of the bag 500. In another embodiment, the hook 506 and the hanger 508 can be connected through an aperture formed in the container. In this manner, the reinforced portion 510 operates to seal the aperture to prevent odors from entering the interior chamber through the aperture.

In one embodiment, the bag 500 includes a seal 512 for accessing the interior chamber 106. The seal 512 can be configured to be reusable such that the bag 500 can be resealed. Alternatively, the bag 500 can be configured to be opened by tearing the bag 500 (i.e., seal 512 is not reusable). Examples of the seal 512 include conventional methods that facilitate the sealing and resealing the bag 500. For example, the seal 512 can comprise hook and loop fasteners (e.g., Velcro®, zippers, or other suitable fasteners). Alternatively, the seal 512 can comprises Ziploc® or other similar fasteners.

FIG. 6 illustrates one embodiment of the bag 500 including additional odor absorbing material 516 positioned within an interior chamber 106. The odor absorbers 516 comprise an odor absorbing agent such as those described above. The odor absorbers 516 can be integrated into the bag 500 or can be placed into pockets formed in the interior chamber 106 of the bag 500. The odor absorbers 516 are configured to absorb odors within the bag 500 thereby reducing remnant odors that may otherwise be absorbed by clothing hung within the bag 500.

Further, in some embodiments of the container 104 an inert gas is placed into the interior chamber 106 when the odor absorbing material 108, or products comprising the odor absorbing material 108, is stored therein. The inert gas
is a gas having a low odor content. The inert gas discourages odors from being absorbed by the odor absorbing material 108 stored within the container 104.

Embodiments of the Article of Clothing

[0044] In one embodiment of the system 100, the article of clothing 102 comprises the odor absorbing material 108. In one embodiment, the article of clothing 102 comprises one or more different layers of material and the odor absorbing material 108 forms one of the layers, a portion of a layer, or a portion of the article of clothing. In another embodiment, the odor absorbing material 108 is adhered to a layer of the article of clothing 102. Examples of such articles of clothing are described in U.S. Pat. Nos. 5,383,236, 5,539,930, 5,790,987, 6,009,559 and 6,134,718. As discussed above, these patents incorrectly claim that when the odor absorbing means is activated charcoal, it may be reactivated merely by machine washing and drying the article of clothing. Embodiments of the present invention operate to maintain the odor absorbing capabilities of such articles of clothing. Further, embodiments of the article of clothing 102 comprise any articles of clothing used for hunting including hunting clothes, jackets, shirts, long underwear, pants, mittens, gloves, hats, sweatshirts, shorts, and other articles of clothing.

[0045] In one embodiment of the method 200, an article of clothing 102 comprising the odor absorbing material 108, such as the articles of clothing described above, is stored in the container 104. Further, the article of clothing 102 comprising the odor absorbing material 108 is removed from the container 104 and worn by a user. In one embodiment, the article of clothing 102 is worn hunting. In another embodiment, after use, the article of clothing 102 is removed by the user and placed in the container 104 for storage during non-use.

[0046] In one embodiment of the system 100, the odor absorbing material 108 is an odor absorbing insert configured for use with the article of clothing 102. In some embodiments, the article of clothing 102 is configured to be worn by a person and comprises a base layer including a vent. The base layer is adapted to substantially surround a portion of the person wearing the article of clothing 102. The insert includes a layer of breathable material and an odor absorbing agent on the layer of breathable material. The insert is configured for removable attachment to the article of clothing 102 adjacent the vent.

[0047] FIG. 7 illustrates one embodiment of the odor absorbing material 108 comprising an odor absorbing insert 700 including the odor absorbing material configured for use with embodiments of the article of clothing 102 having a base layer including at least one vent. The insert 700 includes a base layer 702 and an odor absorbing agent 704. Agent 704 can be bonded to or embedded in layer 702. Further, it is noted that insert 700 can be any size or shape to accommodate a specified application. Examples include, but are not limited to, inserts that are square, rectangular, circular, oval, triangular, or any other symmetrical or asymmetrical shape. In general, the odor absorbing insert 700 is removably attachable to the article of clothing 102, such as any articles of clothing used for hunting including hunting clothes, jackets, shirts, long underwear, pants, mittens, gloves, hats, sweatshirts, shorts, and other articles of clothing for hunting.

[0048] The insert 700 can be removably attached to the article of clothing 102 using any suitable means, such as Velcro® fasteners, zippers, buttons, etc., or stored within a pouch, pocket, or other compartment of the article of clothing. The insert 700 can be designed for removable attachment at any desired location of the article of clothing 102. In one embodiment, the insert 700 is removably attachable adjacent an opening in the clothing, such as a cuff, a neck line, a waist line, or other opening of the article of clothing where air that is exposed to the wearer can escape from under the article of clothing. In one embodiment, the insert 700 is removably attachable to the article of clothing 102 adjacent a vent in a base layer of the article of clothing.

[0049] FIGS. 8A-9B illustrate embodiments of the article of clothing 102 adapted to utilize an odor absorbing insert comprising the odor absorbing material 108.

[0050] In one embodiment illustrated in FIGS. 8A and 8B, the article of clothing 102 is configured to receive at least one odor absorbing insert 808 comprising the odor absorbing material 108. The odor absorbing insert 808 is, in one embodiment, similar to insert 700 illustrated in FIG. 7. However, the insert 808 can be any other suitable configuration. FIG. 8A is a partial front plan view of the article of clothing 102 and odor absorbing insert 808. FIG. 8B is a cross-sectional view of FIG. 8A taken generally along line 83-83.

[0051] The article of clothing 102, an exterior side 804 of which is shown in FIG. 8A, includes a base layer 806 that is configured to substantially surround a portion of the person wearing the article of clothing 102. In other words, the base layer 806 forms the body covering structure of the article of clothing 102. The at least one odor absorbing insert 808 is configured to cover at least one vent 810 in the base layer 806 of the article of clothing 102. The odor absorbing insert 808 is configured to absorb odors emanating from the person to prevent them from entering the environment surrounding the person.

[0052] Preferably, the odor absorbing inserts 808 and vents 810 are positioned on the article of clothing 102 such that, when the article of clothing 102 is worn by a person, they are likely to be positioned adjacent to primary odor-producing areas of the body. Examples of primary odor-producing areas include the armpits, the shoulders, the neck, the crotch area, and the mouth of the person.

[0053] Each vent 810 allows for an airflow 812 (outgoing airflow) to be directed through a specific location of the base layer 806 where the odor absorbing insert 808 is placed. As a result, outgoing airflows 812 are directed through the vent 810 and the odor absorbing insert 808 covering the vent 810 which absorbs odors in the airflow 812 to thereby reduce odor emanation from the person wearing the article of clothing 102 into the surrounding environment.

[0054] It should be understood that the term “vent”, as used herein, is intended to describe an opening through the base layer 806 whose purpose is to allow air to flow from inside the article of clothing 102 to the outside environment, when the article of clothing 102 is worn by a person. Thus, for example, when the article of clothing 102 is in the form of a jacket and is being worn by a person, the vent 810 within the base layer 806 allows the airflow 812 to pass between an interior side 814 of the base layer 806 that is
closest to the person’s body and the environment that is on the exterior side 804 of the base layer 806 that is opposite the interior side 814.

However, the vent 810 is distinguishable from a primary opening that is configured to accommodate a pass-through for a portion of the person wearing the article of clothing. For example, a primary opening at a neckline of an article of clothing in the form of a jacket is not a “vent” as the term is used herein since the opening at the neckline accommodates the neck of the person wearing the jacket. Similarly, a waistline of the jacket that is configured to accommodate a waist of the person wearing the jacket is not a “vent” as the term is used herein. Other examples of non-vent or primary openings in articles of clothing include the opening at a cuff of a sleeve of a shirt or jacket, a waistline of pants, and a cuff at the end of a pant leg.

The shape of the vents 810 of the article of clothing 102 can vary depending on their location. In accordance with one embodiment, the vents 810 include sides, generally designated as 816, that are displaced from each other when the base layer 806 is laid flat. In other words, in one embodiment, the vents 810 are formed by removing a portion of the base layer 806 rather than simply making a slit in the base layer 806. The vents 810 can be any desired shape including rectangular, circular, triangular, irregular, symmetrical, or other shape. In accordance with one embodiment, a breathable material (not shown), such as a mesh, spans the vent and is attached to the sides 816 of the base layer 806.

In general, the odor absorbing insert 808 is configured to cover the vent 810 in the base layer 806, as illustrated in FIGS. 8A and 8B. Although depicted as covering the interior side 814 (FIG. 8B) of the vent 810, the odor absorbing insert 808 could be positioned to cover the exterior side 804 of the vent 810 in the base layer 806.

The odor absorbing inserts 808 can be formed of any desirable shape and is sized to preferably cover the entire vent 810. In one embodiment, the odor absorbing insert 808 generally includes a layer of breathable material on which an odor absorbing agent is applied. For instance, in some embodiments the odor absorbing insert 808 comprises odor absorbing materials described in FIGS. 3A-3C. In one embodiment, the layer of breathable material includes a substantially porous material through which an airflow (such as airflow of FIG. 8B) can easily travel. Embodiments of the layer of breathable material include a mesh, cotton, polypropylene, wool, polyester, or other breathable fabric or material.

The odor absorbing agent is preferably bonded to one or more surfaces of the layer of breathable material in accordance with known methods. The odor absorbing agent 808 preferably includes activated carbon or charcoal. Alternatively, the odor absorbing agent can be formed of other known odor absorbing materials, such as the odor absorbing materials described above.

In accordance with one embodiment, the odor absorbing material 108 is configured for removable attachment to the base layer 806 of the article of clothing 102 at the vent 810. For instance, the odor absorbing insert 808 can be attached directly to the base layer 806 of the article of clothing 102 at the vent 810 as shown in FIG. 8B using one or more conventional fasteners 822. For example, a plurality of fasteners 822 can be provided each having one portion 824 attached to the odor absorbing insert 808, and another portion 826 attached to the base layer 806 of the article of clothing 102 at the perimeter of the vent 810. Examples of suitable fasteners include hook and loop fasteners (e.g., velcro®, buttons, zippers, or other suitable fasteners), which allow for the removal of the odor absorbing insert 808 without damaging the article of clothing 102.

In one embodiment illustrated in FIGS. 9A and 9B, an odor absorbing insert 908 comprising the odor absorbing material 108 is configured for use with the article of clothing 102. At least one breathable pocket 930 is positioned at one of the vents 910 of the article of clothing 102, as shown in FIGS. 9A and 9B. The breathable pockets 930 are used to removably attach the odor absorbing inserts 908 to the article of clothing 102. FIG. 9A is a front plan view of an interior side 914 of the article of clothing 102 and FIG. 9B is a cross-sectional view of FIG. 9A taken generally along line 93-93.

Each breathable pocket 930 is preferably attached to a portion (e.g., an inside surface 914) of the base layer 909 at one of the vents 910. An odor absorbing insert 908 is contained in an interior chamber 932 of the breathable pocket. The breathable pocket 930 generally includes first and second layers of breathable material 934 and 936, respectively. The breathable material is preferably highly breathable such that it provides little resistance to an airflow 912 traveling through the vent 910. Examples of suitable breathable materials for use in forming the first and second layers 934 and 936 includes a mesh, a screen, and other highly breathable materials.

In accordance with one embodiment of the invention, the breathable pocket 930 is permanently mounted to the base layer 906. For example, the first and second layers 934 and 936 can be permanently mounted to the base layer 906 by sewing or gluing them to the base layer 906.

In accordance with another embodiment, the breathable pocket 930 is removably mounted to the base layer 906. For example, one or both of the layers 934 or 936 are removably mounted to the base layer 906 using suitable fasteners at the perimeter of the breathable pocket 930 such as those described above. Preferably, the first and second layers 934 and 936 of the breathable pocket 930 are permanently connected to each other and the fasteners are used to attach only one of the breathable layers to the base layer 906 at the perimeter of the vent 910. In accordance with this embodiment of the invention, the odor absorbing insert 908 could be non-removably contained in the breathable pocket 930, which is removably attached to the base layer 906 of the article of clothing 102.

Another embodiment of the breathable pocket 930 includes an opening 938 (FIG. 9A) through which the interior chamber 932 defined by the first and second layers 934 and 936 is accessible. The opening 938 can preferably be closed using a suitable fastener, such as those described above.

Additionally, the odor absorbing insert 908 is preferably sized to lay flat within the interior chamber 932 and may be configured to have a shape that substantially conforms to the shape of the interior chamber 932. As a result,
the odor absorbing insert 908 can be designed for specific breathable pockets 930 and can be provided with different odor absorbing properties that are tailored to the location of the corresponding breathable pocket 930.

[0067] Additionally, the interior chamber 932 of the breathable pocket 930 is preferably only slightly larger in area than the odor absorbing insert 908 when both are laid flat, in order to accommodate the odor absorbing insert 908. Additionally, the interior chamber 932 of the breathable pocket 930 is preferably only slightly larger in volume than the odor absorbing insert 908. As a result, one embodiment of the breathable pocket 930 provides a snug fit for the odor absorbing insert 908. Such a snug fit allows the odor absorbing insert 908 to be held up against the perimeter of the vent 910 to thereby force most of the airflow 912 traveling through the vent 910 to travel through the odor absorbing insert 908 rather than around it.

[0068] One embodiment of the article of clothing 102 of the system 100 includes an article of clothing, illustrated in FIG. 10, that is adapted for use with odor absorbing inserts comprising the odor absorbing material 108. Some embodiments of the odor absorbing inserts that can be utilized with the article of clothing 102 are disclosed with regard to FIGS. 7, 8A-8B, and 9A-9B. The article of clothing 102 includes an upper body covering article of clothing 1040. The base layer of the article of clothing 1040 generally includes a torso section 1042 and arm sections 1044 that are attached to the torso section 1042. The torso and arm sections 1042 and 1044 are respectively configured to substantially cover a torso and arms of the person wearing the article of clothing 1040. One or more odor absorbing inserts 1008 can be removable attached to the upper body article of clothing 1040 using any of the methods described above and in the exemplary locations described below.

[0069] In accordance with one embodiment of upper body covering article of clothing 1040, the base layer 1006 includes vents 1010 that are located at armpit sections 1046 that are adjacent the torso and arm sections 1042 and 1044. Odor absorbing inserts 1008 are positioned to cover the vents 1010 at the armpit sections 1046 of the base layer 1006 such that they will be positioned at the armpits of the person wearing the article of clothing 1040 to absorb odors at that primary odor-producing location.

[0070] In accordance with another embodiment of the upper body covering article of clothing 1040, the vents 1010 are located in shoulder sections 1048 of the base layer 1006. The shoulder sections 1048 are adjacent a junction between the torso and arm sections 1042 and 1044. When the article of clothing 1040 is worn by a person, the odor absorbing inserts 1008 positioned at the vents 1010 of the shoulder sections 1048 of the base layer 1006 will be positioned next to the shoulders of the person to absorb odors at that primary odor-producing location.

[0071] In accordance with yet another embodiment of the upper body covering article of clothing 1040, a vent 1010 is located below a neckline 1050 of the torso section 1042 of the base layer 1006. When the article of clothing 1040 is worn by a person, that vent 1010 is positioned to overlay an upper back portion of the person when the vent 1010 is located on a back side of the article of clothing 1040, or an upper chest portion of the person when the vent 1010 is located on a front side of the article of clothing 1040. When the odor absorbing insert 1008 covers the vent 1010 it will be positioned at the upper chest and/or upper back of the person wearing the article of clothing 1040.

[0072] Some embodiments of the steps of the method 200 include providing an article of clothing 102 configured to utilize an odor absorbing insert comprising the odor absorbing material 108, such as the inserts and articles of clothing described with regard to FIGS. 7-10. In one embodiment of the method of utilizing the system 100, a method 1100, illustrated in FIG. 11, is provided including a step 1102 of providing an odor absorbing insert, such as the inserts described above, that includes the odor absorbing material 108. The odor absorbing insert is provided in the interior chamber 106 of the substantially airtight container 104. At step 1104, the odor absorbing insert is removed from the container 104. At step 1106, the insert is removably attached to the article of clothing 102 and the article of clothing is worn. In one embodiment, the article of clothing is worn while hunting wild game. At step 1108, after the wearing step, the odor absorbing insert is removed from the article of clothing 102 after it use with the article of clothing. At step 1110, the insert is stored in the interior chamber 106 of the container 104. In one embodiment, the insert in stored in the container during periods of non-use. The container is sealed to prevent odors within the environment surrounding the container from reaching the odor absorbing insert.

[0073] While the systems and methods described herein have been described with regard to an upper body covering article, any configuration is within the scope of the concepts described herein. For example, embodiments of the system 100 and method 200 can include any articles of clothing used for hunting including hunting clothes, jackets, shirts, long underwear, pants, mittens, gloves, hats, sweatshirts, shorts, and other articles of clothing for hunting.

[0074] FIGS. 12A and 12B illustrate embodiments of a method 1200 and system 1208 for manufacturing and distributing odor absorbing materials and products comprising odor absorbing material.

[0075] The method 1200 includes a step 1202 of creating the odor absorbing material 108 or products comprising the material 108. For example, the step 1202 can include creating an odor absorbing insert comprising the odor absorbing material 108 and/or creating embodiments of the article of clothing 102, described above. Embodiments of the step 1202 include manufacturing the odor absorbing material 108 or receiving the odor absorbing material 108 from a manufacturing facility. In one embodiment, the odor absorbing material is maintained in a sealed package from the point of manufacture to a point of receipt of odor absorbing material.

[0076] In one embodiment of the step 1202, an odor absorbing insert is created comprising the odor absorbing material. In one embodiment, the creating step 1202 includes cutting an odor absorbing insert from a sheet of odor absorbing material. In one example, the sheet of odor absorbing material is provided in a sealed packaging wherein the material is removed from the packaging before being cut or is cut while in the packaging.

[0077] At step 1204, the odor absorbing material 108 is stored in the container 104, embodiments of which are
described above. In one embodiment, the creating step 1202 and storing step 1204 occur at a product manufacturing facility 1210 (illustrated in FIG. 12B).

[0078] At step 1206 of the method 1200, the odor absorbing material is transported to a secondary location while the material 108 is in the container 104. As illustrated in FIG. 12B, one embodiment includes transporting the odor absorbing material 108 in the container 104 through a distribution (i.e., shipping) channel 1214 to a distributor or retailer 1216. In one embodiment, the retailer/distributor 1216 further processes (i.e., ships, distributes, displays, sells) the odor absorbing material 108 and/or products containing the odor absorbing material 108 while the odor absorbing material is in the container 104.

[0079] In one embodiment of the system 1208, the odor absorbing material 104, or products comprising the odor absorbing material 104, are manufactured in an odor controlled environment. The odor controlled environment 1300 is an environment containing air having a reduced level of odor particles. In this manner, the odor controlled environment can operate to reduce the exposure of the odor absorbing material 104 to odors during the manufacturing process. As discussed above, exposure of the odor absorbing material 104 to odors during the manufacturing process can reduce the odor absorbing lifespan of the material 104. Thus, the odor controlled environment can operate to prevent unwanted reduction in the odor absorbing capabilities of the material 104 during manufacture.

[0080] One embodiment of an odor controlled environment 1300 is illustrated in FIG. 13. Odor controlled environment 1300 comprises a cleanroom 1310 in which the odor absorbing material 104, odor absorbing inserts comprising the odor absorbing material 104, and/or clothing comprising the odor absorbing material 104 can be manufactured. In one embodiment, the cleanroom 1310 can be constructed within an existing manufacturing facility. One example of a modular cleanroom is the Series 577 Vertical Flow Softwall Modular Cleanroom manufactured by Clean Air Products of Minneapolis, Minn. In another embodiment, the cleanroom 1310 can comprise a separate, dedicated room within a manufacturing facility.

[0081] In one embodiment, an airflow 1330 into and/or out of the cleanroom is provided. Further, in one embodiment, an airflow system 1320 is utilized for removing odors from the airflow 1330. In one embodiment, the airflow system 1320 can be exterior to the cleanroom 1320. However, in another embodiment the airflow system 1320 is mounted within the cleanroom environment. One example of a filter unit is the Series 112 Motorized Ceiling Fan Filter Unit manufactured by Clean Air Products of Minneapolis, Minn. In one embodiment, the filter system 1320 comprises a high efficiency particulate air filter (HEPA) for removing odor particles from the airflow.

[0082] Cleanroom 1310 also can include a controlled access 1350 that enables access to and from the cleanroom. For instance, in one embodiment access 1350 includes a sealable door. In another embodiment, controlled access 1350 comprises a pair of doors that form a separate room for performing pre-cleanroom procedures such as gowning. In another embodiment, the controlled access 1350 comprises curtains that are opened to enter the cleanroom. In yet another embodiment, the curtains or doors can be configured to automatically reseal after opening.

[0083] In another embodiment, workers within the cleanroom wear gowns, masks, or other conventional cleanroom apparel during manufacture of the odor absorbing products to limit exposure of the odor absorbing material 104 to odors.

[0084] Although the present invention has been described with reference to preferred embodiments, workers skilled in the art will recognize that changes may be made in form and detail without departing from the spirit and scope of the invention.

What is claimed is:

1. An odor absorbing system for use with an article of clothing for hunting that is configured to be worn by a person and includes a base layer adapted to substantially surround a portion of the person wearing the article of clothing, the base layer including a vent, the system comprising:

   a container having a substantially airtight interior chamber; and

   an odor absorbing insert stored in the interior chamber, the insert comprising a layer of breathable material and an odor absorbing agent on the layer of breathable material, wherein the insert is configured for removable attachment to the article of clothing adjacent the vent.

2. The system of claim 1, wherein the container comprises a resealable opening to the interior chamber.

3. The system of claim 1, wherein the odor absorbing insert is configured to cover the vent.

4. An odor absorbing hunting system comprising:

   an article of clothing for hunting;

   a container having a substantially airtight interior chamber; and

   an odor absorbing material including carbon, the odor absorbing material stored in the interior chamber of the container.

5. The system of claim 4, wherein:

   the article of clothing is adapted to substantially surround a portion of a person wearing the article of clothing and comprises the odor absorbing material; and

   the article of clothing and the odor absorbing material are stored in the interior chamber of the container.

6. The system of claim 5, further comprising a hanger within the interior chamber and connected to the container.

7. The system of claim 6, wherein the article of clothing is supported on the hanger.

8. The system of claim 4, wherein:

   the article of clothing includes a base layer adapted to substantially surround a portion of the person wearing the article of clothing, the base layer including a vent; and

   the system further comprises an odor absorbing insert stored in the interior chamber of the container and comprising the odor absorbing material, wherein the insert is configured for removable attachment to the article of clothing adjacent the vent.

9. The system of claim 8, wherein the odor absorbing insert is configured to cover the vent.

10. The system of claim 4, wherein the container comprises a resealable opening to the interior chamber.
11. A method of manufacturing and distributing an odor absorbing system for hunting, comprising:
providing an odor absorbing material configured for use with an article of clothing adapted to be worn by a user for hunting; and
storing the odor absorbing material in an interior chamber of a substantially airtight container.
12. The method of claim 11, further comprising:
transporting the odor absorbing material in the container and the article of clothing to a secondary location selected from the group consisting of a distributor and a retailer.
13. The method of claim 11, wherein storing comprises:
opening the container;
placing the odor absorbing material in the interior chamber of the container; and
sealing the container.
14. The method of claim 11 comprising:
cutting an odor absorbing insert from a sheet of odor absorbing material comprising carbon, wherein the insert is configured for removable attachment to an article of clothing for hunting; and
storing the odor absorbing insert in a substantially airtight container, wherein cutting and storing occur at a manufacturing facility.
15. The method of claim 11 comprising:
forming an article of clothing for hunting including an odor absorbing material; and
storing the article of clothing in the interior chamber of the container.
16. The method of claim 15, further comprising hanging the article of clothing within the interior chamber of the container.
17. The method of claim 16, wherein hanging the article of clothing comprises placing the article of clothing on a hanger and attaching the hanger to a portion of the container that is within the interior chamber.
18. The method of claim 16, wherein the container comprises an elongate bag having a resealable opening.
19. The method of claim 11, wherein providing the odor absorbing material comprises manufacturing the odor absorbing material in an odor controlled environment including an air filtration system.
20. A method of reducing odor emanation from a person into an environment surrounding the person, comprising:
providing an odor absorbing material comprising carbon;
storing the odor absorbing material in an interior chamber of a substantially airtight container;
removing the odor absorbing material from the container;
wearing the odor absorbing material on the person; and
hunting wild game while wearing the article of clothing.
21. The method of claim 20, wherein:
providing the odor absorbing material comprises providing an odor absorbing insert including the odor absorbing material in the interior chamber of an airtight container; and
removing the odor absorbing material comprises removing the odor absorbing insert from the container;
wherein the method further comprises
removably attaching the insert to a portion of an article of clothing; and
wearing the odor absorbing material comprises wearing the article of clothing.
22. The method of claim 21, wherein, after wearing the odor absorbing material, the method further comprises:
removing the odor absorbing insert from the article of clothing;
placing the odor absorbing insert into the container; and
sealing the container.
23. The method of claim 20, wherein:
providing the odor absorbing material comprises providing an article of clothing including the odor absorbing material in the interior chamber of the airtight container;
removing the odor absorbing material comprises removing the article of clothing from the container; and
wearing the odor absorbing material comprises wearing the article of clothing.
24. The method of claim 23, wherein, after wearing the odor absorbing material, the method further comprises:
placing the article of clothing in the container; and
sealing the container.

* * * * *