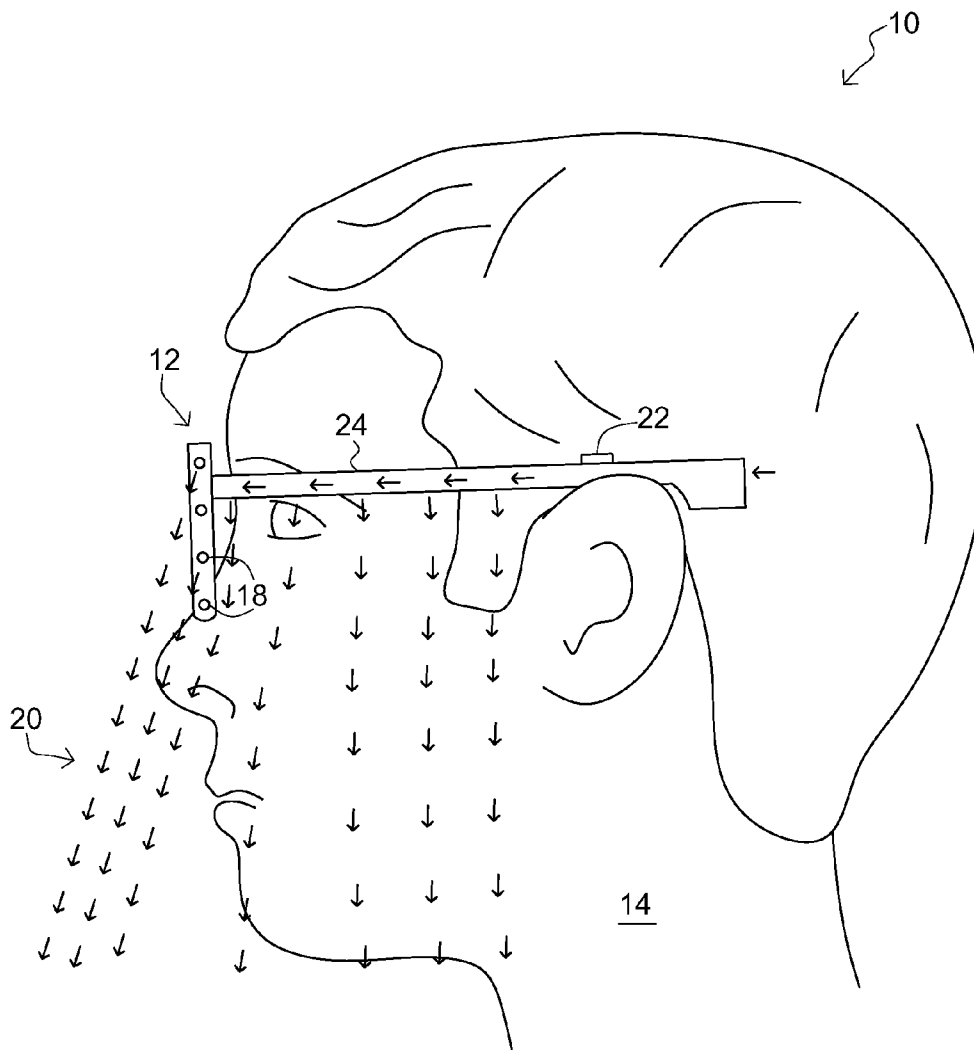




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(19) **United States**(12) **Patent Application Publication**
Wilson(10) **Pub. No.: US 2014/0102442 A1**(43) **Pub. Date: Apr. 17, 2014**(54) **FACIAL ACCESSORY SYSTEM**(71) Applicant: **Roger D. Wilson**, Boise, ID (US)(72) Inventor: **Roger D. Wilson**, Boise, ID (US)(21) Appl. No.: **13/652,216**(22) Filed: **Oct. 15, 2012****Publication Classification**(51) **Int. Cl.**
F24F 13/00 (2006.01)(52) **U.S. Cl.**
USPC **128/200.28**(57) **ABSTRACT**

A facial accessory system for prophylactic face protection. The system includes a facial accessory configured to be worn about the face of a user. The facial accessory include a channel disposed therethrough in fluid communication with an array of apertures orientated and positioned to generate a substantially continuous curtain of airflow about a face of a user when air is forced therethrough. The system includes an airflow distribution device in fluid communication with the channel of the facial accessory. The airflow distribution device is configured to selectively force air to flow there-through.



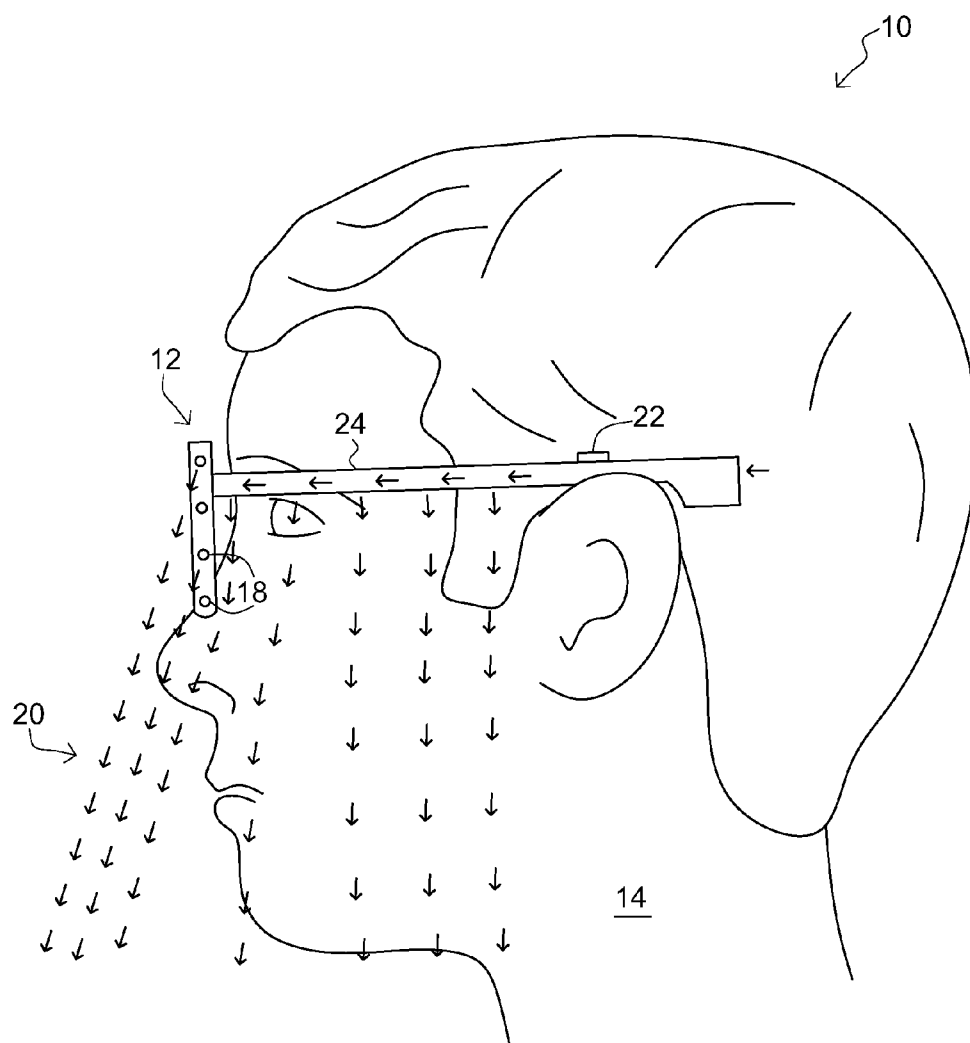


FIG. 1

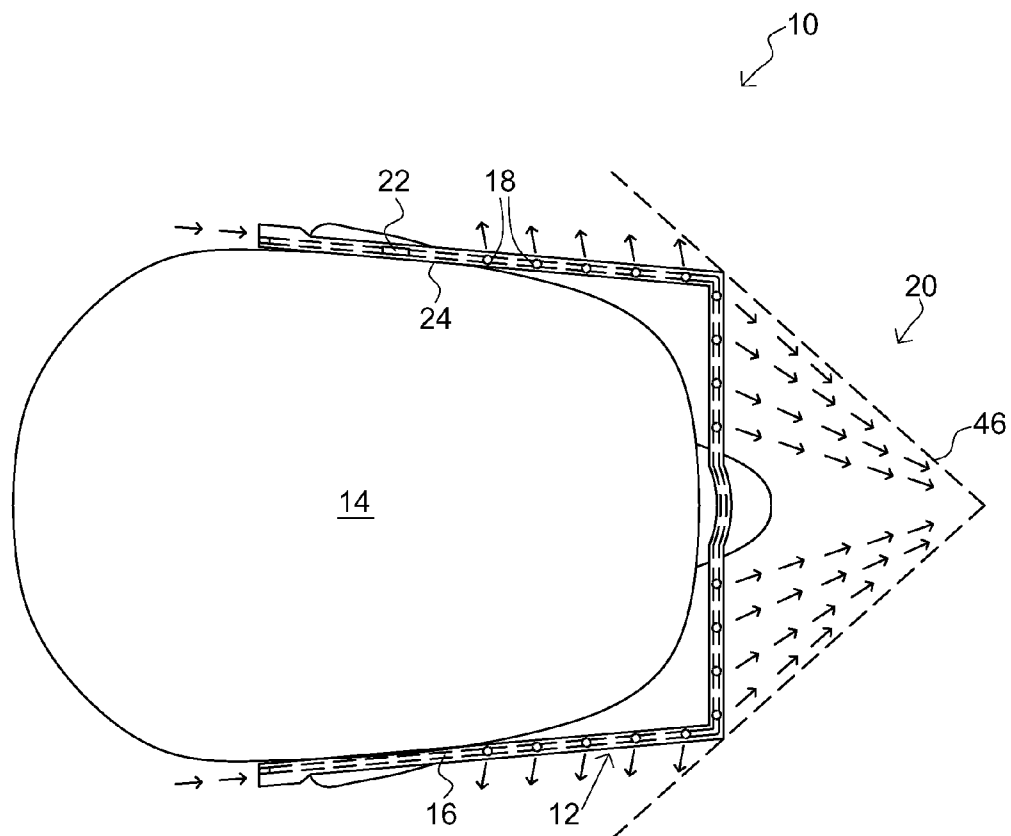


FIG. 2

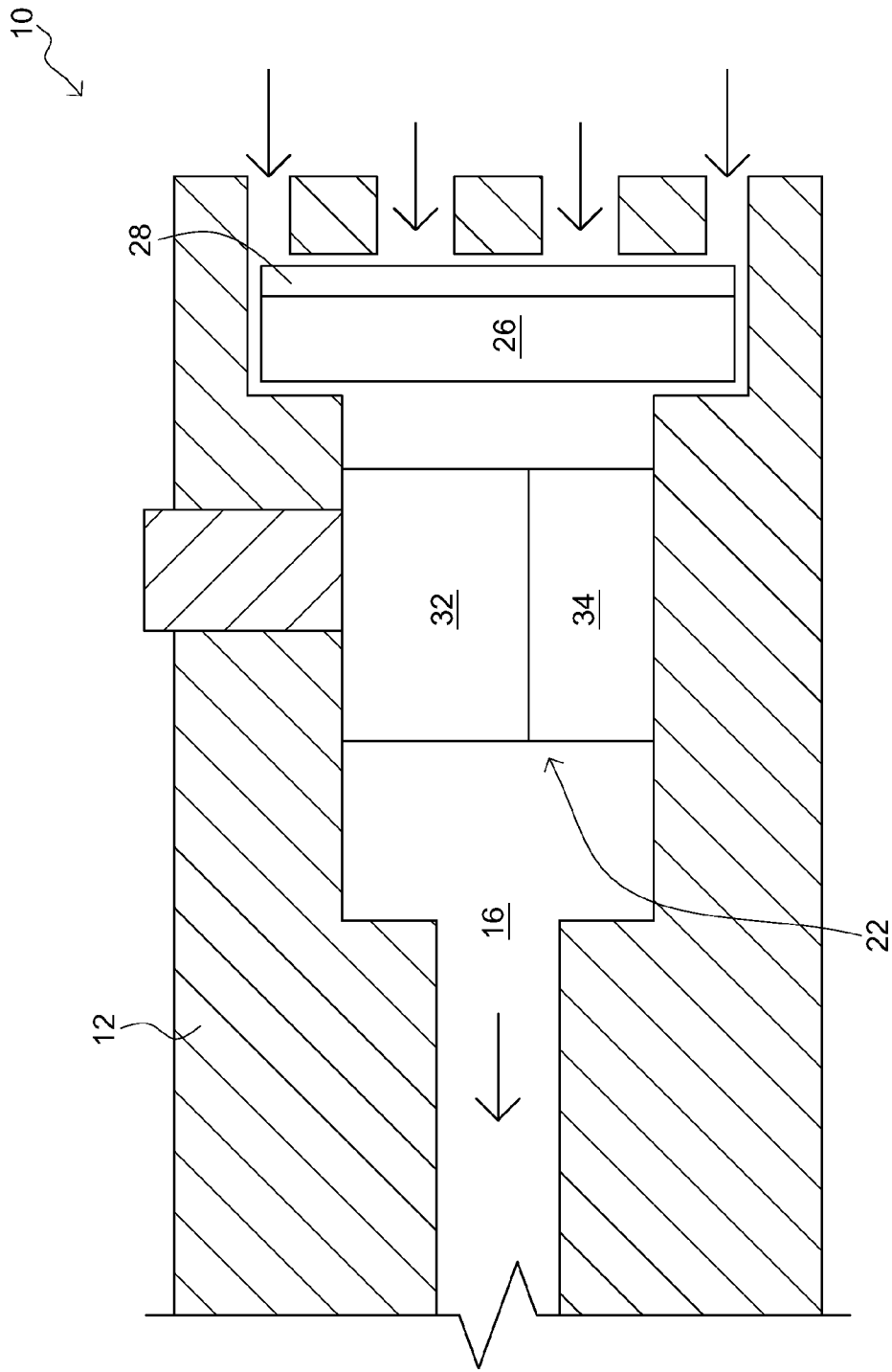


FIG. 3

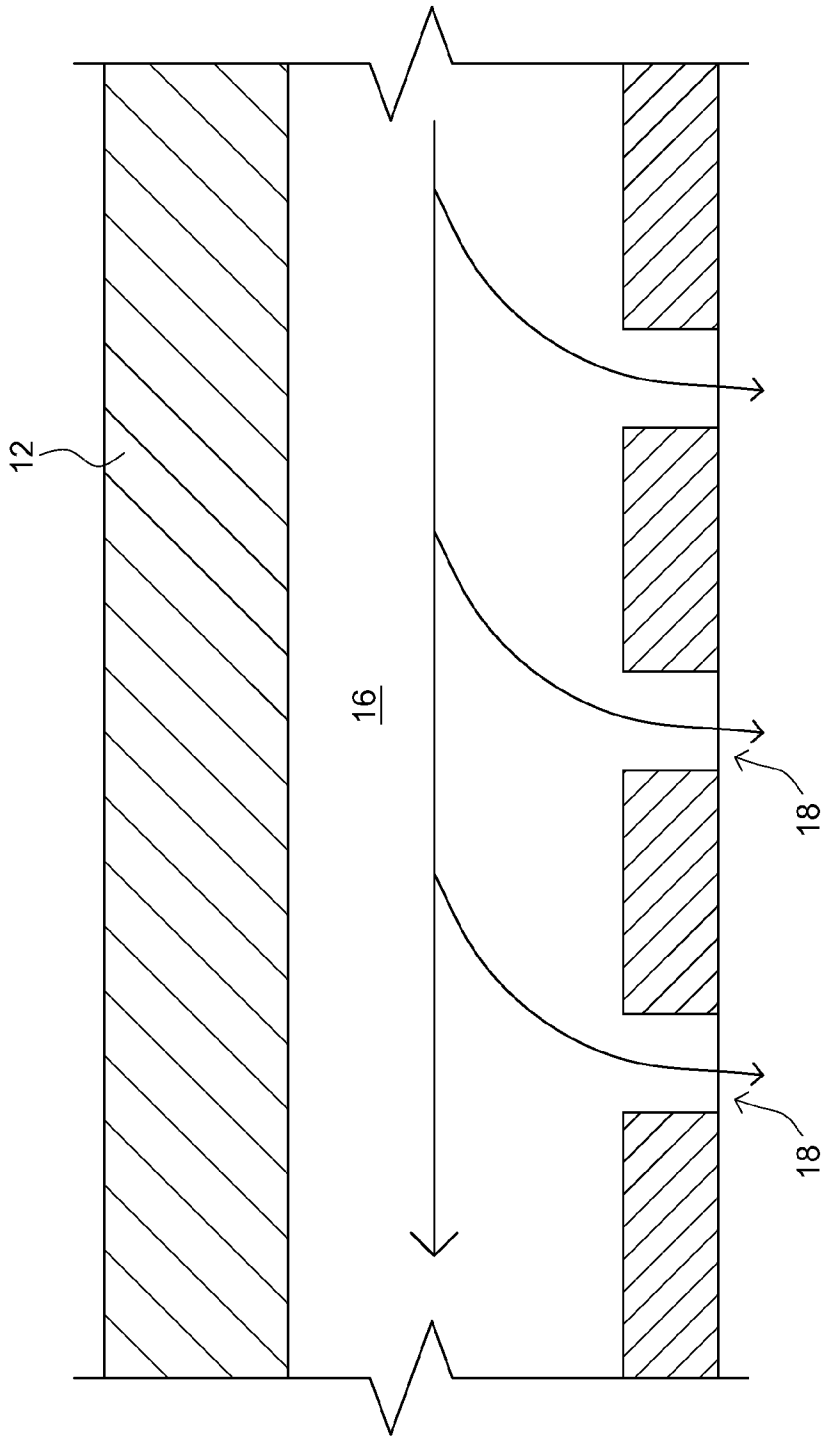


FIG. 4

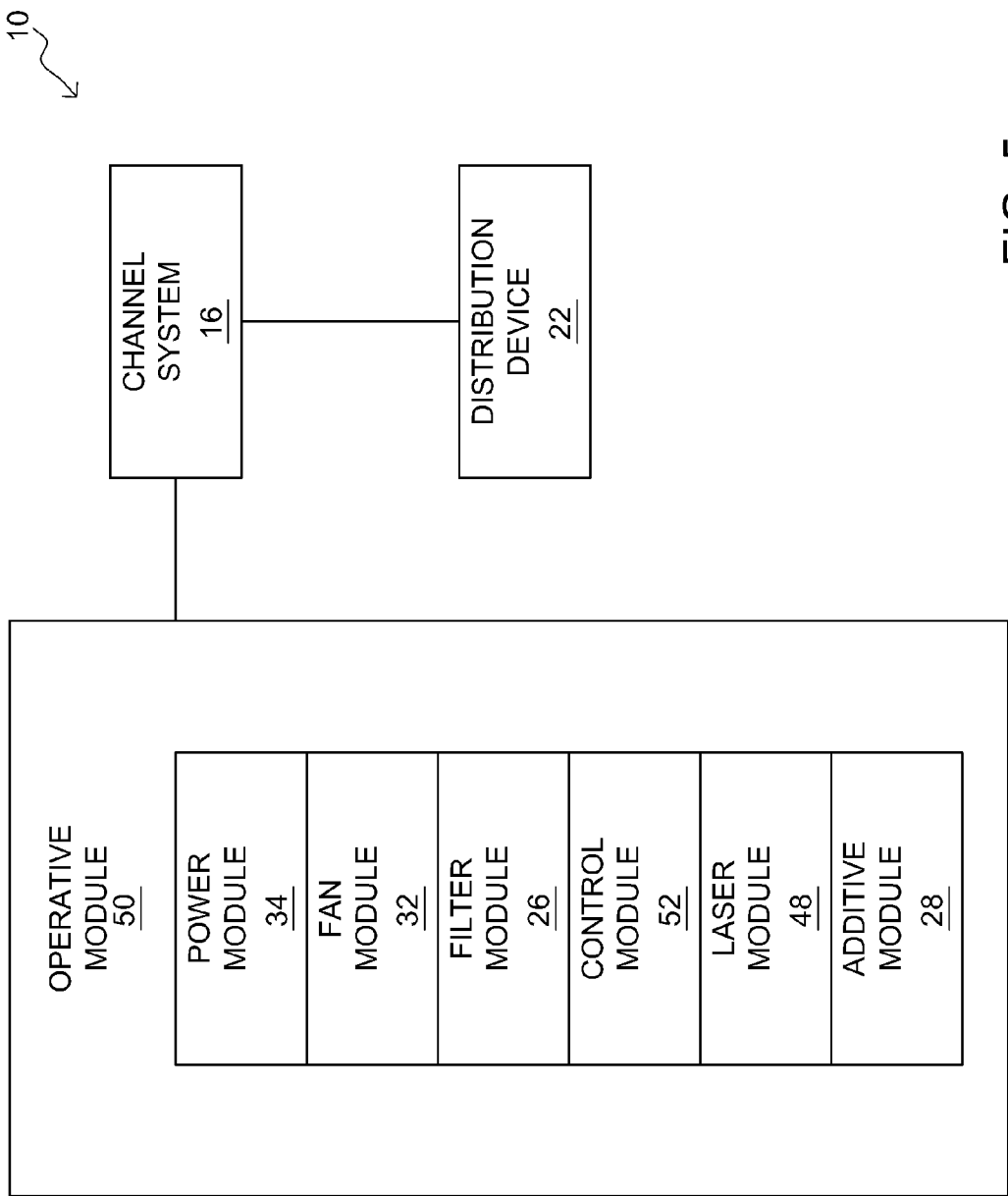


FIG. 5

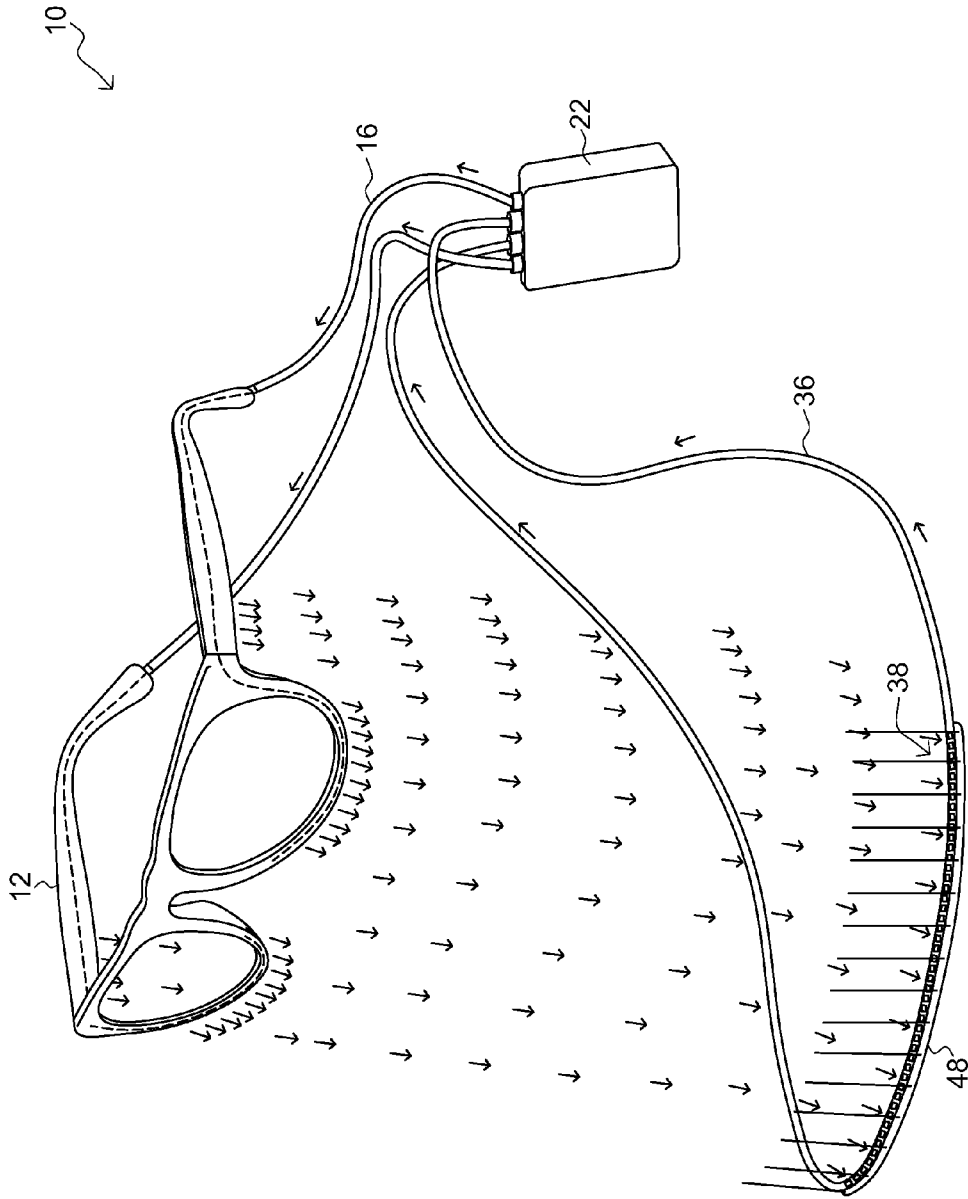


FIG. 6

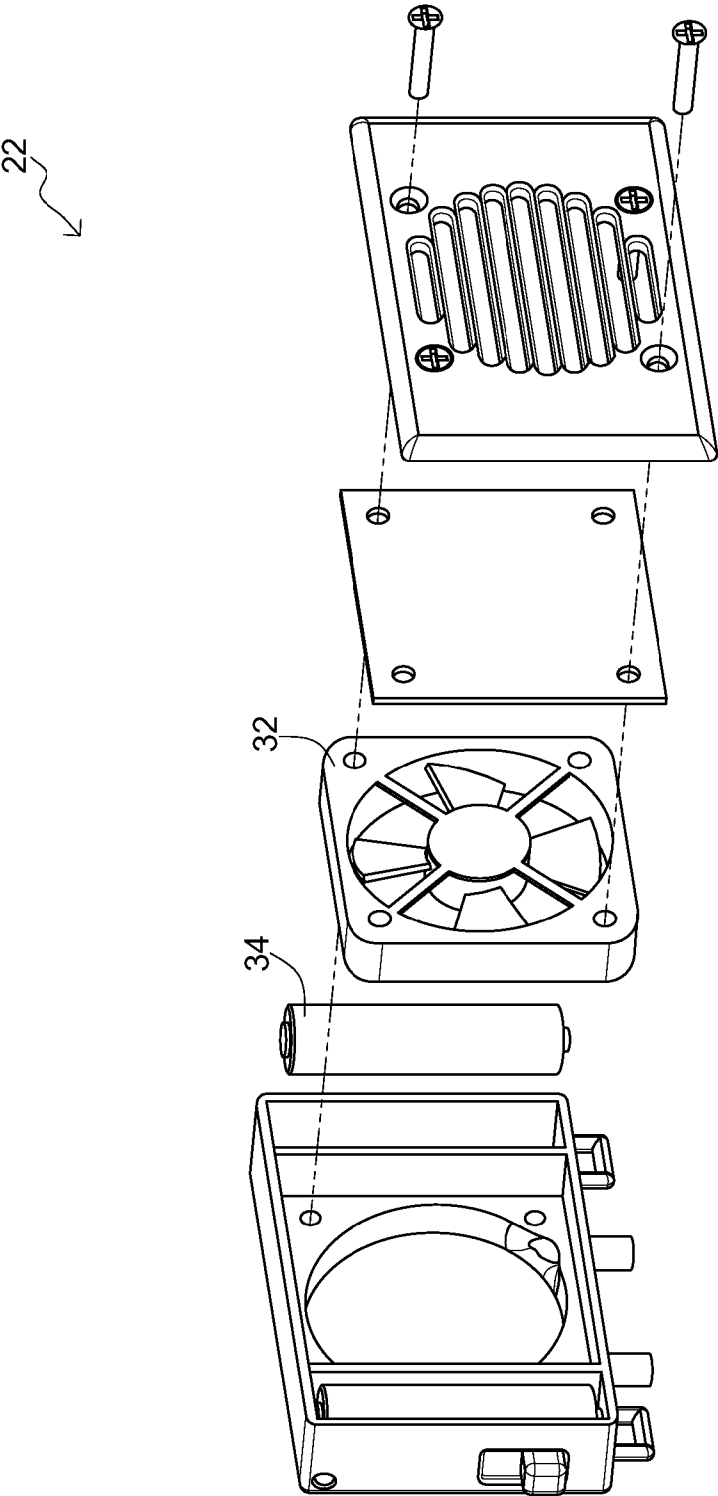


FIG. 7

10

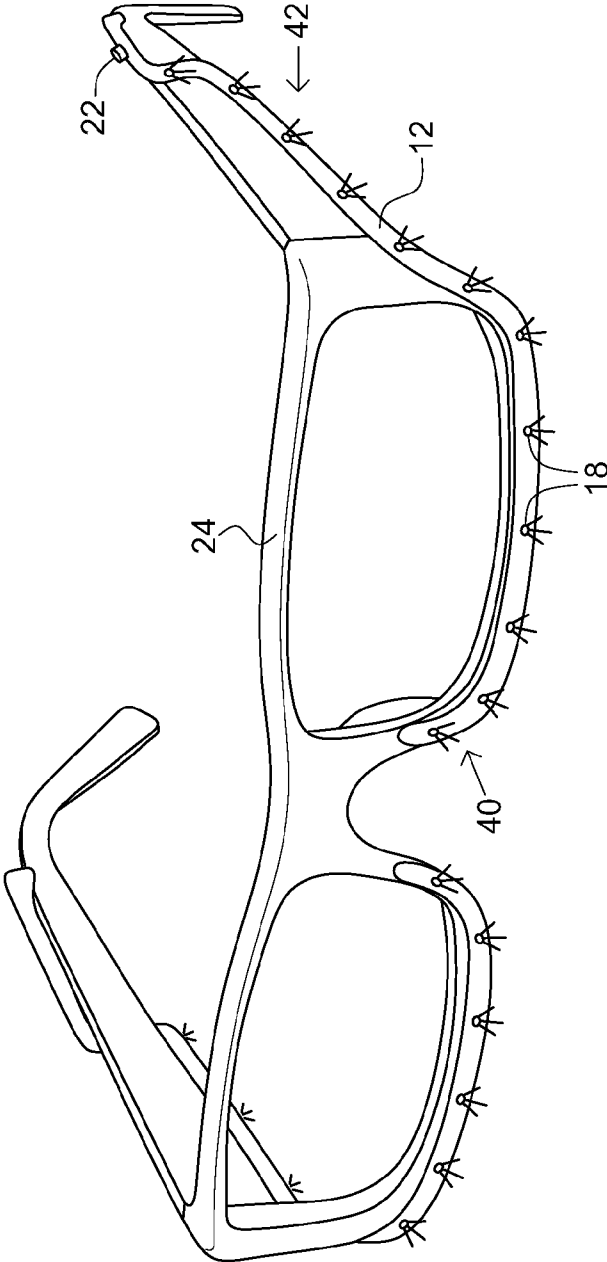


FIG. 8

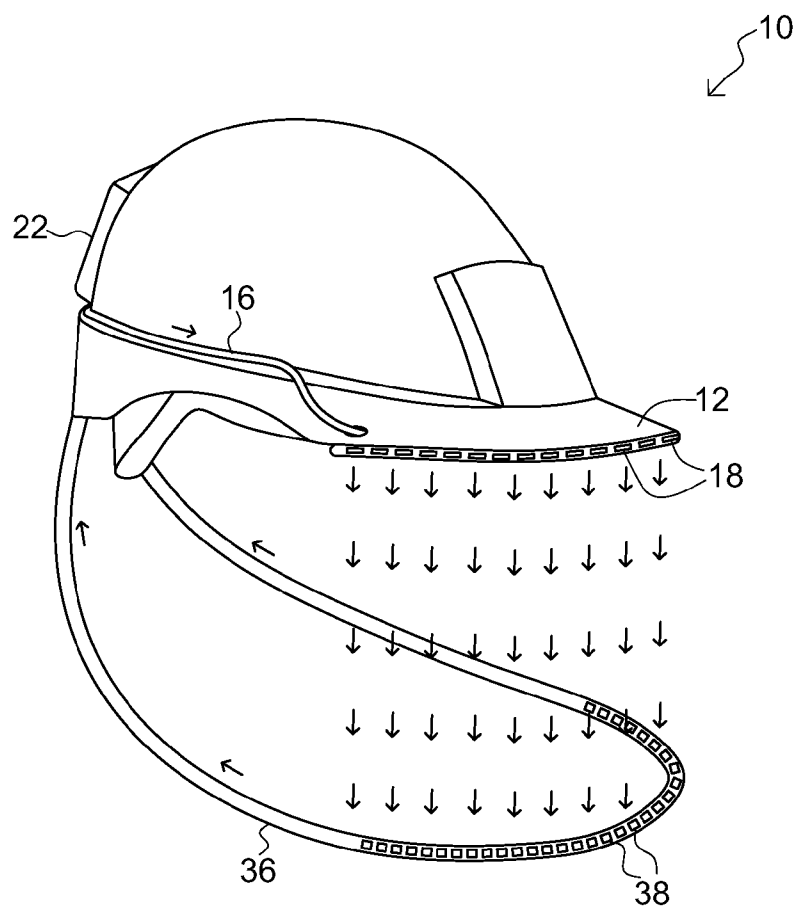
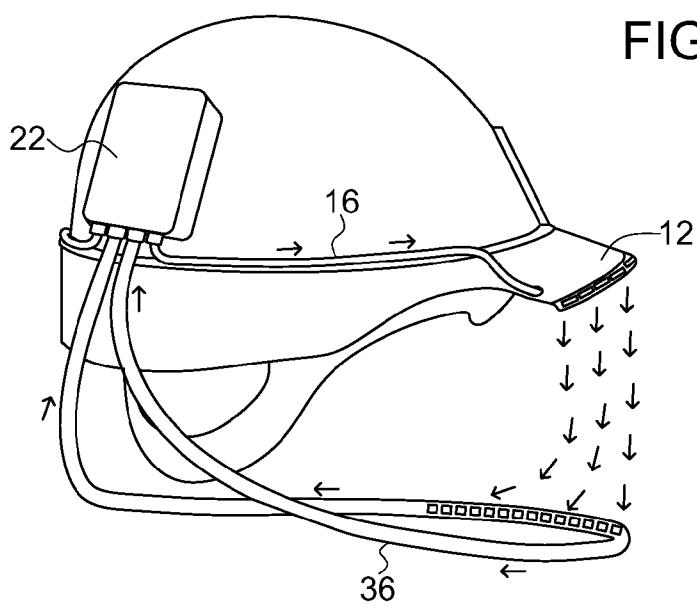


FIG. 9



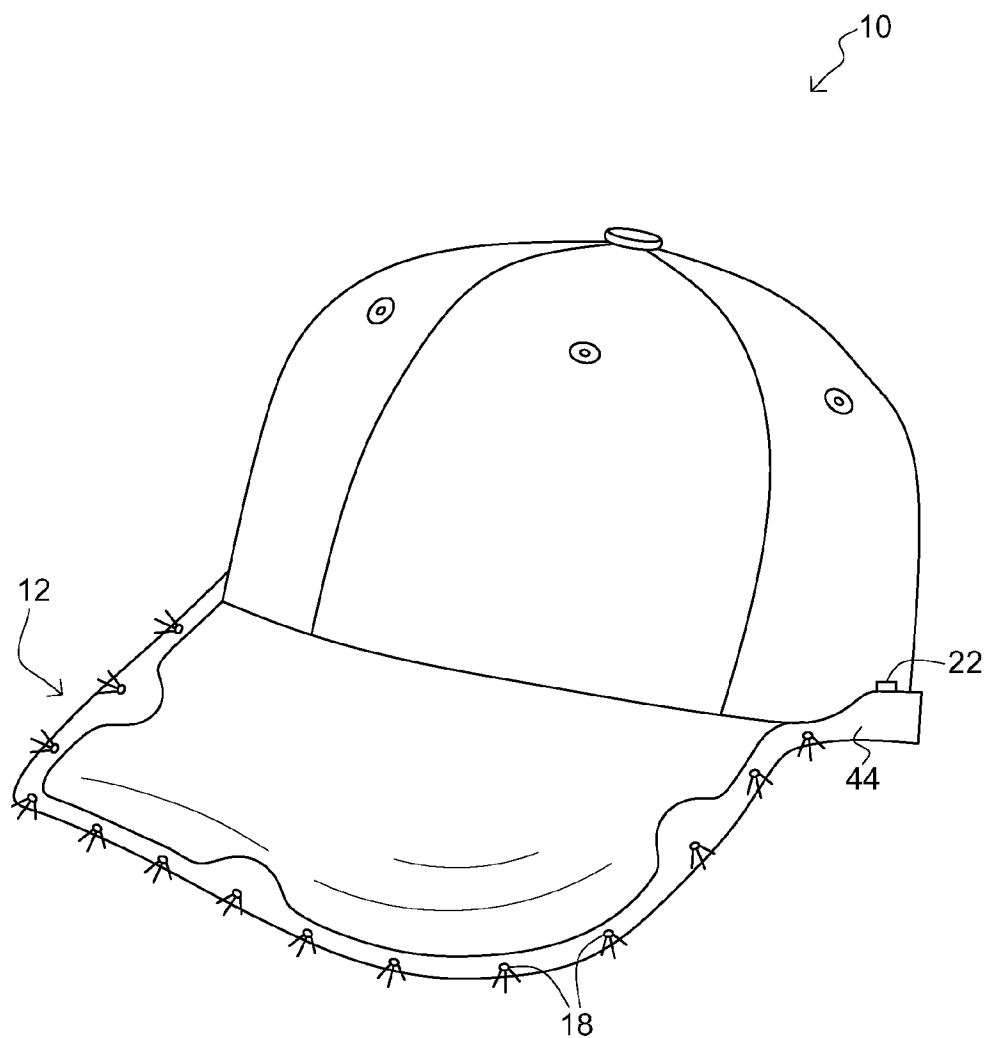


FIG. 10

FACIAL ACCESSORY SYSTEM

BACKGROUND OF THE INVENTION

[0001] 1. Field of the Invention

[0002] The present invention relates to air dispensing devices, specifically to a facial accessory system.

[0003] 2. Description of the Related Art

[0004] A respirator is a device designed to protect the wearer from inhaling harmful dusts, fumes, vapors, or gases. Respirators come in a wide range of types and sizes used by the military, private industry, and the public. Respirators range from cheaper, single-use, disposable masks to reusable models with replaceable cartridges. There are two main categories: the air-purifying respirator, which forces contaminated air through a filtering element, and the air-supplied respirator, in which an alternate supply of fresh air is delivered. Within each category, different techniques are employed to reduce or eliminate noxious airborne contents.

[0005] All respirators have some type of facepiece held to the wearer's head with straps, a cloth harness, or some other method. The facepiece of the respirator covers either the entire face or the bottom half of the face including the nose and mouth. Half-face respirators can only be worn in environments where the contaminants are not toxic to the eyes or facial area. For example, someone who is painting an object with spray paint could wear a half-face respirator, but someone who works with chlorine gas would have to wear a full-face respirator. Facepieces come in many different styles and sizes, to accommodate all types of face shapes, and there are many books and references available for determining which kind of hazard requires what type of respirator. Air-purifying respirators are used against particulates (such as smoke or fumes), gases, and vapors that are at atmospheric concentrations less than immediately dangerous to life and health.

[0006] Some improvements have been made in the field. Examples of references related to the present invention are described below in their own words, and the supporting teachings of each reference are incorporated by reference herein:

[0007] U.S. Pat. No. 7,823,586, issued to Glazman, discloses a respiratory protection system which is worn by a passenger during a flight in air plane, by a patient visiting hospital or doctors office, a nurse working with a patient during hospital stay, or the like. The system includes a relatively light weight, substantially rigid, headgear structure, containing an air disinfection chamber, a fan means, a filter means, an ultraviolet air disinfection means, an air blanket origination means and an energizing means.

[0008] U.S. Pat. No. 7,464,705, issued to Tanizawa et al., discloses a powered respiration comprising, an air supplying unit and a filter equipped to a face piece part of said powered respiration, wherein an electric fan, a motor and a battery are installed in said air supplying unit.

[0009] U.S. Pat. No. 7,037,188, issued to Schmid et al., discloses a system to significantly improve the air quality in a personal breathing environment. The system includes a blower unit that produces a conditioned air flow, a delivery system that delivers air provided by the blower unit to a person's breathing zone, and a conduit that interconnects the blower unit and the delivery system for directing conditioned air from the blower unit to the delivery system. The delivery system is positioned so that it sends conditioned air around an individual's head and into the individual's personal breathing zone, thereby creating a zone of conditioned air around the individual's head.

[0010] U.S. Pat. No. 7,036,502, issued to Manne, discloses a device for creating a curtain of air across the face is a headset with a fan mounted thereon. The outlet of the fan has flexible tubing or cowlings which allows for control of both direction and cross section of a curtain of air that crosses the face. The curtain of air prevents airborne particles and chemicals from making contact with the face.

[0011] U.S. Pat. No. 6,409,338, issued to Jewell, discloses a headphone and fan device is provided having a sunglasses unit for receiving electronic audio signals from a modified portable audio device and transmitting the signals to detachable earphones mounted on the sunglasses unit. The sunglasses unit is further modified to couple with an airflow unit having one or more visor-mounted electric fans positioned to discharge air upon the user's upper facial area. Such air exits the airflow unit through a vent, that is a compressible pad that is circumferentially attached to the outer edge of a visor, the pad having channels about the same circumference, through which the air exits. A typical portable audio device is modified to store and transmit electric power to the sunglasses unit in a cord that simultaneously transmits electronic audio signals. This electric power is routed through the sunglasses unit to the airflow unit and on to the fan. Alternately, the cord can deliver either or both electric power and electronic audio signals directly to the airflow unit, for powering the fan, and transmitting the signals to the earphones, the earphones being mountable on the airflow unit, as well as, the sunglasses unit. The airflow unit can strap to the user's head, and either the sunglasses unit or the airflow unit can be independently utilized.

[0012] The inventions heretofore known suffer from a number of disadvantages which include being limited in use, being unable to filter air, being unable to provide a substantially continuous airflow, being ineffective, being inefficient, being expensive, being limited in compatibility, being bulky to wear, being difficult to use, failing to provide fresh air, failing to shield from undesired material in the air, failing to prevent the spread of disease, being uncomfortable, looking awkward, placing undue strain on the neck of the user, and etc.

[0013] What is needed is a facial accessory system that solves one or more of the problems described herein and/or one or more problems that may come to the attention of one skilled in the art upon becoming familiar with this specification.

SUMMARY OF THE INVENTION

[0014] The present invention has been developed in response to the present state of the art, and in particular, in response to the problems and needs in the art that have not yet been fully solved by currently available air dispensing systems. Accordingly, the present invention has been developed to provide an effective and efficient facial accessory system configured to provide a substantially continuous flow of air about a face of a user.

[0015] According to one embodiment of the invention, there is a facial accessory system/device for prophylactic face protection. The system may include a facial accessory that may be configured to be worn about the face of a user. The facial accessory may include a channel disposed therethrough in fluid communication with an array of apertures that may be orientated and positioned to generate a substantially continuous curtain of airflow about a face of a user when air is forced therethrough. The system may include an airflow distribution

device in fluid communication with the channel of the facial accessory. The airflow distribution device may be configured to selectively force air to flow therethrough.

[0016] The facial accessory may include a pair of eyeglasses that may have the channel disposed throughout a frame of the pair of eyeglasses. The airflow distribution device may include an air filter module in fluid communication with the channel and may be configured to filter air forced through the airflow distribution device. The airflow distribution device may further include an air additive module in fluid communication with the channel and may be configured to provide a fluid additive to the air forced through the airflow distribution device.

[0017] The airflow distribution device may include a fan module that may be configured to selectively force air to flow through the facial accessory. The airflow distribution device may include a power module in communication with the fan module and may be configured to provide a power source to the modules and components of the air distribution device.

[0018] The system may further include an air return device in fluid communication with the airflow distribution device. The air return device may include a plurality of apertures that may be configured to intake air forced therethrough by the airflow distribution device. The facial accessory may be coupled to a bottom portion of a frame and about a temple and earpiece portion of a pair of eyeglasses. The airflow distribution device may be disposed within an earpiece portion of a pair of eyeglasses. The substantially continuous curtain of airflow may include a wedge shaped cross-section of airflow about a face of a user. The air return device and the facial accessory may include a laser barrier system that may be configured to direct a beam of coherent light between the air return device and the facial accessory.

[0019] Reference throughout this specification to features, advantages, or similar language does not imply that all of the features and advantages that may be realized with the present invention should be or are in any single embodiment of the invention. Rather, language referring to the features and advantages is understood to mean that a specific feature, advantage, or characteristic described in connection with an embodiment is included in at least one embodiment of the present invention. Thus, discussion of the features and advantages, and similar language, throughout this specification may, but do not necessarily, refer to the same embodiment.

[0020] Furthermore, the described features, advantages, and characteristics of the invention may be combined in any suitable manner in one or more embodiments. One skilled in the relevant art will recognize that the invention can be practiced without one or more of the specific features or advantages of a particular embodiment. In other instances, additional features and advantages may be recognized in certain embodiments that may not be present in all embodiments of the invention.

[0021] These features and advantages of the present invention will become more fully apparent from the following description and appended claims, or may be learned by the practice of the invention as set forth hereinafter.

BRIEF DESCRIPTION OF THE DRAWINGS

[0022] In order for the advantages of the invention to be readily understood, a more particular description of the invention briefly described above will be rendered by reference to specific embodiments that are illustrated in the appended drawing(s). It is noted that the drawings of the invention are

not to scale. The drawings are mere schematics representations, not intended to portray specific parameters of the invention. Understanding that these drawing(s) depict only typical embodiments of the invention and are not, therefore, to be considered to be limiting its scope, the invention will be described and explained with additional specificity and detail through the use of the accompanying drawing(s), in which:

[0023] FIG. 1 is a side elevational view of a facial accessory system disposed on a user, according to one embodiment of the invention;

[0024] FIG. 2 is a top plan view of a facial accessory system disposed on a user, according to one embodiment of the invention;

[0025] FIG. 3 is a cross-sectional view of a blower portion of a facial accessory system, according to one embodiment of the invention;

[0026] FIG. 4 is a cross-sectional view of a channel portion of a facial accessory of a facial accessory system, according to one embodiment of the invention;

[0027] FIG. 5 is a module diagram of a facial accessory system, according to one embodiment of the invention;

[0028] FIG. 6 is a perspective view of a facial accessory system, according to one embodiment of the invention;

[0029] FIG. 7 is an exploded view of an airflow distribution device of a facial accessory system, according to one embodiment of the invention;

[0030] FIG. 8 is a perspective view of a facial accessory system coupled to a pair of eyeglasses, according to one embodiment of the invention;

[0031] FIG. 9 illustrates a pair of perspective views of a facial accessory system, according to one embodiment of the invention; and

[0032] FIG. 10 is a perspective view of a facial accessory system coupled to a hat, according to one embodiment of the invention.

DETAILED DESCRIPTION OF THE INVENTION

[0033] For the purposes of promoting an understanding of the principles of the invention, reference will now be made to the exemplary embodiments illustrated in the drawing(s), and specific language will be used to describe the same. It will nevertheless be understood that no limitation of the scope of the invention is thereby intended. Any alterations and further modifications of the inventive features illustrated herein, and any additional applications of the principles of the invention as illustrated herein, which would occur to one skilled in the relevant art and having possession of this disclosure, are to be considered within the scope of the invention.

[0034] Many of the functional units described in this specification have been labeled as modules, in order to more particularly emphasize their implementation independence. For example, a module may be implemented as a hardware circuit comprising custom VLSI circuits or gate arrays, off-the-shelf semiconductors such as logic chips, transistors, or other discrete components. A module may also be implemented in programmable hardware devices such as field programmable gate arrays, programmable array logic, programmable logic devices or the like.

[0035] Modules may also be implemented in software for execution by various types of processors. An identified module of programmable or executable code may, for instance, comprise one or more physical or logical blocks of computer instructions which may, for instance, be organized as an object, procedure, or function. Nevertheless, the executables

of an identified module need not be physically located together, but may comprise disparate instructions stored in different locations which, when joined logically together, comprise the module and achieve the stated purpose for the module.

[0036] Indeed, a module and/or a program of executable code may be a single instruction, or many instructions, and may even be distributed over several different code segments, among different programs, and across several memory devices. Similarly, operational data may be identified and illustrated herein within modules, and may be embodied in any suitable form and organized within any suitable type of data structure. The operational data may be collected as a single data set, or may be distributed over different locations including over different storage devices, and may exist, at least partially, merely as electronic signals on a system or network.

[0037] The various system components and/or modules discussed herein may include one or more of the following: a host server or other computing systems including a processor for processing digital data; a memory coupled to said processor for storing digital data; an input digitizer coupled to the processor for inputting digital data; an application program stored in said memory and accessible by said processor for directing processing of digital data by said processor; a display device coupled to the processor and memory for displaying information derived from digital data processed by said processor; and a plurality of databases. As those skilled in the art will appreciate, any computers discussed herein may include an operating system (e.g., Windows Vista, NT, 95/98/2000, OS2; UNIX; Linux; Solaris; MacOS; and etc.) as well as various conventional support software and drivers typically associated with computers. The computers may be in a home or business environment with access to a network. In an exemplary embodiment, access is through the Internet through a commercially-available web-browser software package.

[0038] The present invention may be described herein in terms of functional block components, screen shots, user interaction, optional selections, various processing steps, and the like. Each of such described herein may be one or more modules in exemplary embodiments of the invention. It should be appreciated that such functional blocks may be realized by any number of hardware and/or software components configured to perform the specified functions. For example, the present invention may employ various integrated circuit components, e.g., memory elements, processing elements, logic elements, look-up tables, and the like, which may carry out a variety of functions under the control of one or more microprocessors or other control devices. Similarly, the software elements of the present invention may be implemented with any programming or scripting language such as C, C++, Java, COBOL, assembler, PERL, Visual Basic, SQL Stored Procedures, AJAX, extensible markup language (XML), with the various algorithms being implemented with any combination of data structures, objects, processes, routines or other programming elements. Further, it should be noted that the present invention may employ any number of conventional techniques for data transmission, signaling, data processing, network control, and the like. Still further, the invention may detect or prevent security issues with a client-side scripting language, such as JavaScript, VBScript or the like.

[0039] Additionally, many of the functional units and/or modules herein are described as being “in communication” with other functional units and/or modules. Being “in communication” refers to any manner and/or way in which functional units and/or modules, such as, but not limited to, computers, laptop computers, PDAs, modules, and other types of hardware and/or software, may be in communication with each other. Some non-limiting examples include communicating, sending, and/or receiving data and metadata via: a network, a wireless network, software, instructions, circuitry, phone lines, internet lines, satellite signals, electric signals, electrical and magnetic fields and/or pulses, and/or so forth.

[0040] As used herein, the term “network” may include any electronic communications means which incorporates both hardware and software components of such. Communication among the parties in accordance with the present invention may be accomplished through any suitable communication channels, such as, for example, a telephone network, an extranet, an intranet, Internet, point of interaction device (point of sale device, personal digital assistant, cellular phone, kiosk, etc.), online communications, off-line communications, wireless communications, transponder communications, local area network (LAN), wide area network (WAN), networked or linked devices and/or the like. Moreover, although the invention may be implemented with TCP/IP communications protocols, the invention may also be implemented using IPX, Appletalk, IP-6, NetBIOS, OSI or any number of existing or future protocols. If the network is in the nature of a public network, such as the Internet, it may be advantageous to presume the network to be insecure and open to eavesdroppers. Specific information related to the protocols, standards, and application software utilized in connection with the Internet is generally known to those skilled in the art and, as such, need not be detailed herein. See, for example, DILIP NAIK, INTERNET STANDARDS AND PROTOCOLS (1998); JAVA 2 COMPLETE, various authors, (Sybex 1999); DEBORAH RAY AND ERIC RAY, MASTERING HTML 4.0 (1997); and LOSHIN, TCP/IP CLEARLY EXPLAINED (1997), the contents of which are hereby incorporated by reference.

[0041] Reference throughout this specification to an “embodiment,” an “example” or similar language means that a particular feature, structure, characteristic, or combinations thereof described in connection with the embodiment is included in at least one embodiment of the present invention. Thus, appearances of the phrases an “embodiment,” an “example,” and similar language throughout this specification may, but do not necessarily, all refer to the same embodiment, to different embodiments, or to one or more of the figures. Additionally, reference to the wording “embodiment,” “example” or the like, for two or more features, elements, etc. does not mean that the features are necessarily related, dissimilar, the same, etc.

[0042] Each statement of an embodiment, or example, is to be considered independent of any other statement of an embodiment despite any use of similar or identical language characterizing each embodiment. Therefore, where one embodiment is identified as “another embodiment,” the identified embodiment is independent of any other embodiments characterized by the language “another embodiment.” The features, functions, and the like described herein are considered to be able to be combined in whole or in part one with another as the claims and/or art may direct, either directly or indirectly, implicitly or explicitly.

[0043] As used herein, “comprising,” “including,” “containing,” “is,” “are,” “characterized by,” and grammatical equivalents thereof are inclusive or open-ended terms that do not exclude additional unrecited elements or method steps. “Comprising” is to be interpreted as including the more restrictive terms “consisting of” and “consisting essentially of.”

[0044] FIG. 1 is a side elevational view of a facial accessory system disposed on a user, according to one embodiment of the invention. There is shown a facial accessory system 10 worn about the face of a user 14 including an array of apertures 18 generating a substantially continuous curtain of airflow 20. The system combines the benefits of the facial accessory with the benefits of enhanced air quality for the user in a single device without substantially increasing the bulkiness or burden associated with air quality enhancement products. Further, the system does not generate the same stigma or social reaction typically associated with air quality devices.

[0045] The illustrated facial accessory system 10 is configured to provide prophylactic face protection. The system 10 includes a facial accessory 12 configured to be worn about a face of a user 14. The illustrated facial accessory 12 is a pair of eyeglasses 24 configured to be worn about a face of the user 14. The facial accessory 12 includes an array of apertures 18 orientated and positioned to generate a substantially continuous curtain of airflow 20 about a face of the user 14. The system 10 includes an airflow distribution device 22 in fluid communication with the facial accessory 12. The airflow distribution device 22 is configured to selectively force air through the facial accessory 12 and out the array of apertures 18.

[0046] According to one embodiment of the invention, there is shown a facial accessory equipped on a person and in operation including an airflow distribution device coupled to the facial accessory. Each portion is fluid coupled to the next whereby fluid (air) may be channeled from the airflow distribution device through a channel system and into (and out of) the facial accessory. Such coupling is generally by fluid-tight systems of channels such as but not limited to tubes, hoses, elongated cavities, and the like that permit fluid flow therethrough and substantially prevent fluid from escaping the predetermined and intended path, except through predetermined apertures.

[0047] The illustrated facial accessory is configured to provide a substantially continuous curtain of airflow in front of a user's face. The facial accessory includes an airflow distribution device configured to draw air through an aperture and filter the air flowing therethrough. The airflow distribution device is coupled to a channel system configured to facilitate movement of the filtered air from the airflow distribution device to the facial accessory. The illustrated channel system is disposed within the facial accessory, extending through the frame of a pair of eyeglasses.

[0048] The illustrated facial accessory is a pair of eyeglasses. The channel system is disposed through the pair of support arms and through a rim/frame of the pair of eyeglasses. The facial accessory includes an array of apertures disposed about the front portion of the facial accessory, the rim, and the pair of support arms configured to force/dispense air therethrough. The facial accessory is configured to direct air flow downwards from the facial accessory, thereby creating a substantially continuous curtain of airflow directly in front of a user's face. Accordingly, contaminants on the side

of the air curtain that is opposite the side of the user's face, will be restricted from flowing towards the user's face.

[0049] In one embodiment, there is a facial accessory system that moves air in front of user's face to effectively create a continuous curtain of airflow or a wall of air for the purposes of shielding a user's face from bacteria, airborne pathogens, dangerous fluids (including gasses), viruses, pollution, dust, pollen, allergens, fumes, mold, flying or floating particles and the like and combinations thereof, including but not limited to materials in the air generated by working materials, chemicals, investigating locations, cleaning, machining, interacting with people, performing medical duties, and the like and combinations thereof.

[0050] Such may include a facial accessory that may serve other purposes, such as but not limited to glasses, sunglasses, visors, hats, head bands, scarves, belt, shirt collar, clothes, safety devices, badges, ornamental devices, and the like and combinations thereof. There may be a set of channels through a body of the facial accessory that permit air to flow through the body to dispersal apertures strategically located about the body of the facial accessory such that when air is pressurized inside the facial accessory, air will project through the apertures and form an effective curtain of airflow.

[0051] According to one embodiment of the invention, there may be an airflow distribution device, such as but not limited to a pump or connection to a body of pressurized air. Such an air pressurizer is disposed to a facial accessory at a rear location, such as but not limited to near the ears of the wearer and may draw air from a location substantially remote from the front of a person's face and then project that same air over the front of the user's face. An air pump may be a variable speed air pump and the particular speed may be manually and/or automatically selectable and such may be triggered by actuation of a switch/button/etc., sound levels, particular sounds, light motion, position, location, and the like and combinations thereof. Accordingly, the system may be set at a low speed for general use but then may be triggered to heavy duty use (higher speed of air flow) upon a trigger condition. In one non-limiting example, a system may include one or more modules configured to trigger activation of an airflow distribution device upon a sensor module detecting a particular sound (such as but not limited to the whine of a motor associated with the generation of undesired airborne material like a power tool, a sneeze, or etc.), detecting activation of another device that may be remote, detecting a change in light levels or light characteristics, detecting a period of time generally associated with decreased air quality (pollen based allergens tend to be worse in the morning), and the like and combinations thereof. Triggering may be accomplished by a signal transmitted over a network to which the system may be connected, through a network module configured to communicate over a network.

[0052] Such a system may be disguised and/or be fully contained internal to a facial accessory and/or may include a remote device coupled to the facial accessory such that on casual inspection the user does not appear to be wearing any protective gear other than that represented by the obvious other function of the facial accessory (sight correction, shielding from the sun, etc.).

[0053] A facial accessory may be structured and/or configured to include apertures that are positioned and/or oriented such that a substantially continuous curtain of airflow is generated having a v-shaped, u-shaped, w-shaped, L-shaped, s-shaped, straight line, curved, polygonal, or combination

thereof cross section when viewed from above. Such an air wall may contact the surface of the user's face completely, partially, or not at all. Advantageously, systems such as those described herein may generate a zone or field of air that is substantially free from contaminants, and/or may include one or more additives that are desired or otherwise beneficial.

[0054] FIG. 2 is a top plan view of a facial accessory system disposed on a user, according to one embodiment of the invention. There is shown a facial accessory system 10 worn about the face of a user 14 including an array of apertures 18 generating a substantially continuous curtain of airflow 20 across a front region of the face of the user in a general v-shaped cross section.

[0055] The illustrated facial accessory system 10 is configured to provide prophylactic face protection. The system 10 includes a facial accessory 12 configured to be worn about a face of a user 14. The facial accessory 12 includes a channel 16 disposed therethrough in fluid communication with an array of apertures 18 orientated and positioned to generate a substantially continuous curtain of airflow 20 about a face of the user 14 when air is forced therethrough. The illustrated circles 18 of this figure represent the locations of the channels on a bottom surface of the facial accessory and are not to be confused with upward oriented channels. However, it is contemplated that one or more variations of the invention may include upwardly oriented channels that may be positioned on a top, bottom, or side surface of a facial accessory.

[0056] The illustrated system 10 includes an airflow distribution device 22 in fluid communication with the channel 16 of the facial accessory 12. Such an airflow distribution device may include one or more fans or air pumps that may cause air to flow through the channel. Generally, such an airflow distribution device will be powered electrically, generally by battery, such that the device may provide continuous airflow for a period of time. The airflow distribution device 22 is configured to selectively force air to flow therethrough.

[0057] The illustrated facial accessory 12 includes a pair of eyeglasses 24 having a channel 16 disposed throughout a frame of the pair of eyeglasses 24. The airflow distribution device 22 is configured to selectively force air to flow through the facial accessory 12. The airflow distribution device 22 is disposed within an earpiece portion of the pair of eyeglasses 24. The illustrated substantially continuous curtain of airflow 20 includes a wedge shaped cross-section of airflow 46 about a face of the user 14. It is believed that a wedge-shaped or v-shaped cross-sectional air curtain provides enhanced protection for forward moving users, as such will tend to redirect airflow going towards the face to the sides of the face of the user. Such a wedge or v-shaped cross-sectional curtain of air may be a thin-walled cross-section using apertures that are shaped to direct air in a generally straight line or may be a block pattern wherein apertures towards the middle, thicker portion of the wedge may either be more numerous and oriented at different angles and/or may be shaped to project a more diffuse air flow that results in a wider air distribution down the face.

[0058] The substantially continuous curtain of airflow is configured to shield a user's face from bacteria, airborne pathogens, dangerous fluids (including gasses), viruses, pollution, dust, pollen, allergens, fumes, mold, flying or floating particles and the like and combinations thereof, including but not limited to materials in the air generated by working materials, chemicals, investigating locations, cleaning, machin-

ing, interacting with people, performing medical duties, and the like and combinations thereof.

[0059] FIG. 3 is a cross-sectional view of a facial accessory system, according to one embodiment of the invention. There is shown a portion of a facial accessory 12 (such as but not limited to an earpiece portion of a pair of eyeglasses) including a channel 16 in communication with an airflow distribution device 22 having a fan module 32 and a power module 34 along with an air filter module 26 and an air additive module 28.

[0060] The illustrated facial accessory system 10 includes a facial accessory 12, such as but not limited to a pair of eyeglasses, configured to be worn about a face of a user. The facial accessory 12 includes a channel 16 disposed therethrough in fluid communication with an array of apertures. The system 10 includes an airflow distribution device 22 in fluid communication with the channel 16 of the facial accessory 12. The airflow distribution device 22 is configured to selectively force air to flow therethrough.

[0061] The airflow distribution device 22 includes an air filter module 26 in fluid communication with the channel 16 and configured to filter air forced through the airflow distribution device 22. The airflow distribution device 22 further includes an air additive module 28 in fluid communication with the channel 16 and configured to provide a fluid additive to the air forced through the airflow distribution device 22. The air additive module 28 may be a pad configured to absorb a fluid additive thereon, and when air is forced therethrough by the airflow distribution device 22, the fluid additive is dispersed therein. Non-limiting examples of a fluid additive may be: essential oils, medicines, disinfectants, materials reactive to pollutants, and the like and combinations thereof.

[0062] The illustrated airflow distribution device 22 includes a fan module 32 configured to selectively force air to flow through the channel 16 of the facial accessory 12. Non-limiting examples of a fan module may be a fan module as described in U.S. Patent Publication No.: 2002/0094283, by Salmen et al., or a fan module as described in U.S. Pat. No. 7,271,561, issued to Chen et al., which are incorporated for their supporting teachings herein. The airflow distribution device 22 includes a power module 34 in communication with the fan module 32 and configured to provide a power source to the modules and components of the air distribution device 22. Non-limiting examples of a power module may be a power module as described in U.S. Pat. No. 4,262,213, issued to Eichelberger et al., or a power module as described in U.S. Pat. No. 4,392,009, issued to Napoli, which are incorporated for their supporting teachings herein. The illustrated airflow distribution device 22 is disposed within an earpiece portion of a pair of eyeglasses.

[0063] FIG. 4 is a cross-sectional view of a facial accessory of a facial accessory system, according to one embodiment of the invention. There is shown a facial accessory 12 including a channel 16 in fluid communication with an array of apertures 18.

[0064] The illustrated facial accessory 12 is configured for prophylactic face protection. The facial accessory 12 is configured to be worn about a face of a user. The facial accessory 12 includes a channel 16 disposed therethrough in fluid communication with an array of apertures 18 orientated and positioned to generate a substantially continuous curtain of airflow about a face of a user when air is forced therethrough. The array of apertures 18 may include variations in aperture size, length, height, design, shape, width, configuration,

diameter, circumference, etc. in order to create a substantially continuous curtain of airflow having a v-shaped, u-shaped, w-shaped, L-shaped, s-shaped, straight line, curved, polygonal, or combination thereof cross section.

[0065] In one non-limiting example, apertures are cylindrical holes that are symmetrical about their axis and of a similar shape and size throughout the device.

[0066] In another non-limiting example, apertures are of an increasing cross-sectional area as a function of distance from an airflow distribution device as measured through the channel(s) such that apertures closer to the airflow distribution device are more resistant to airflow than those further away.

[0067] In still another non-limiting example, apertures include pressure compensating emitters such that airflow is not permitted except at a minimum threshold pressure. Such a system helps to equally (or as a function of minimum thresholds of each emitter) distribute airflow among apertures.

[0068] In still yet another non-limiting example, apertures may be frustoconical (or otherwise varying in cross-sectional area from one end to another) and such may cause airflow therefrom to be either focused or diffuse according to the orientation of the frustoconical aperture (e.g. whether the narrow end is in the direction of the airflow or opposite).

[0069] FIG. 5 is a module diagram of a facial accessory system, according to one embodiment of the invention. There is shown a facial accessory system 10 including an operative module 50 having a power module 34, a fan module 32, a filter module 26, a control module 52, a laser module 48, and an additive module 28, in communication with a channel system and a distribution device 22.

[0070] The illustrated facial accessory system 10 is configured to provide prophylactic face protection. The system 10 includes an operative module 50 configured to be worn about a face of a user. The operative module 50 is in fluid communication with a channel system 16 configured to distribute air forced therethrough. The system 10 includes a distribution device 22 in fluid communication with the operative module 50 through the channel system 16, having an array of apertures orientated and positioned to generate a substantially continuous curtain of airflow about a face of a user when air is forced therethrough.

[0071] The illustrated operative module 50 includes a fan module 32 configured to selectively force air to flow through the channel 16 of the facial accessory 12. Non-limiting examples of a fan module may be a fan module as described in U.S. Patent Publication No.: 2002/0094283, by Salmen et al., or a fan module as described in U.S. Pat. No. 7,271,561, issued to Chen et al., which are incorporated for their supporting teachings herein.

[0072] The operative module 50 includes a power module 34 in communication with the fan module 32 and configured to provide a power source to the modules and components of the operative module 50. Non-limiting examples of a power module may be a power module as described in U.S. Pat. No. 4,262,213, issued to Eichelberger et al., or a power module as described in U.S. Pat. No. 4,392,009, issued to Napoli, which are incorporated for their supporting teachings herein.

[0073] The operative module 50 includes a filter module 26 in fluid communication with the channel system 16 and configured to filter air forced through the operative module 50. Non-limiting examples of a filter module may be an air filter module as described in U.S. Pat. No. 6,321,637, issued to Shanks et al., or an air filter module as described in U.S. Pat.

No. 5,833,727, issued to Skarsten, which are incorporated for their supporting teachings herein.

[0074] The operative module 50 includes an additive module 28 in fluid communication with the channel system 16 and configured to provide a fluid additive to the air forced through the operative module 50. Non-limiting examples of an additive module may be an absorbent pad as described in U.S. Pat. No. 7,425,664, issued to Maass Jr. et al.; or an absorbent pad as described in U.S. Pat. No. 5,203,806, issued to Broida, which are incorporated for their supporting teachings herein.

[0075] The operative module includes a control module 52 in communication with the modules and components of the operative module and configured to provide operational instructions thereto. Non-limiting examples of a control module may be a control module described in U.S. Pat. No. 5,430,836, issued to Wolf et al.; or a control module described in U.S. Pat. No. 6,243,635, issued to Swan et al. which are incorporated for their supported teachings herein. A control module may include but is not limited to a processor, a state machine, a script, a decision tree, and the like.

[0076] The operative module 50 includes a laser module 48 in communication with the distribution device 22 and configured to direct a beam of coherent light in front of the user. In one non-limiting example, there is a laser barrier system included in the facial accessory, such that one or more beams of laser light is oriented to form a barrier in front of a face of a user of the facial accessory. Such may include one or more laser devices, reflecting devices, structural supports, and the like such that any air moving towards the face of the user is likely to traverse the laser barrier. The laser may be of varying strengths and frequencies and such may be sufficient to incinerate particles, such as but not limited to allergens, may be of sufficient strength to damage or destroy bacteria and other biological and/or may otherwise transform and/or purify the air. In another non-limiting embodiment the laser and/or other light may be used to project a heads-up-display in front of the face of the user, such as but not limited to projecting the same onto lenses, a visor, and/or another region in front of the user such that information from one or more other modules described herein may be there displayed. Non-limiting examples of a laser module may be a laser module as described in U.S. Pat. No. 4,336,223, issued to Hillman, or a laser module as described in U.S. Pat. No. 4,482,809, issued to Maarschalkerweerd, which are incorporated for their supporting teachings herein.

[0077] FIG. 6 is a perspective view of a facial accessory system, according to one embodiment of the invention. There is shown a facial accessory system 10 including a facial accessory 12, an airflow distribution device 22, and an air return device 36.

[0078] The illustrated facial accessory system is configured to provide prophylactic face protection for a user. The system 10 includes a facial accessory 12 configured to be worn about a face of a user, such as, but not limited to a pair of eyeglasses. The facial accessory 12 includes a channel disposed therethrough in fluid communication with an array of apertures orientated and positioned to generate a substantially continuous curtain of airflow about a face of a user when air is forced therethrough.

[0079] The system 10 includes an airflow distribution device 22 in fluid communication with the channel of the facial accessory 12. The airflow distribution device 22 is configured to selectively force air to flow therethrough. The illustrated airflow distribution device 22 configured to couple

to a user's neck or chest region (or otherwise) by a lanyard or other elongated member. The airflow distribution device 22 is configured to draw air through an aperture and filter the air therethrough. The airflow distribution device 22 is in communication with a channel configured to facilitate movement of the filtered air from the airflow distribution device 22 to a facial accessory 12.

[0080] The illustrated channel system 16 includes a pair of tubes configured to couple the airflow distribution device 22 to the facial accessory 12. The airflow distribution device 22 may be coupled to an elongated member, such as but not limited to a lanyard, clip, snap, hook, hook-and-loop, and the like, configured to secure the airflow distribution device 22 about the neck or chest region of a user, similar to a necklace.

[0081] The illustrated airflow distribution device is configured to couple to a facial accessory, such as a pair of support arms of a pair of glasses. The pair of tubes are each configured to couple to an end of the pair of support arms. Each of the support arms of the illustrated facial accessory 12 includes a channel configured to facilitate movement of air from the channel system 16 to a front portion of the facial accessory. In one embodiment, only a single support arm includes a channel. The channel is disposed through the pair of support arms and through a frame/rim of the pair of glasses. The facial accessory includes an array of apertures disposed about the front portion of the facial accessory, the frame/rim, and the pair of support arms configured to dispense air therethrough. The facial accessory 12 is configured to direct air flow downwards from the facial accessory 12, thereby creating a substantially continuous curtain of airflow directly in front of a user's face.

[0082] The illustrated system 10 further includes an air return device 36 in fluid communication with the airflow distribution device 22. The air return device 36 includes a plurality of apertures 38 configured to intake air forced therethrough by the airflow distribution device. The illustrated air return device 36 includes a laser barrier system 48 configured to direct a beam of coherent light between the air return device 36 and the facial accessory 12.

[0083] FIG. 7 is an exploded view of an airflow distribution device of a facial accessory system, according to one embodiment of the invention. There is shown an airflow distribution device 22 including a fan module 32 and a power module 34.

[0084] The illustrated airflow distribution device 22 is configured to be in fluid communication with a channel of a facial accessory. The airflow distribution device 22 is configured to selectively force air to flow through a facial accessory. The airflow distribution device 22 includes a fan module 32 configured to selectively force air to flow through a facial accessory. The airflow distribution device 22 includes a power module 34 in communication with the fan module and configured to provide a power source to the modules and components of the air distribution device 22.

[0085] FIG. 8 is a perspective view of a facial accessory system coupled to a pair of eyeglasses, according to one embodiment of the invention. There is shown a facial accessory system 10 coupled to a pair of eyeglasses 24.

[0086] The illustrated facial accessory system 10 is configured to provide prophylactic face protection. The system 10 includes a facial accessory 12 coupled to a pair of eyeglasses 24 and configured to be worn about a face of a user. The facial accessory 12 includes a channel disposed therethrough in fluid communication with an array of apertures 18 orientated and positioned to generate a substantially continuous curtain

of airflow about a face of a user when air is forced therethrough. The system 10 includes an airflow distribution device 22 in fluid communication with the channel of the facial accessory 12 and configured to selectively force air to flow therethrough.

[0087] The illustrated facial accessory 12 is configured to couple to a bottom portion 40 of a frame and about a temple and earpiece portion 42 of a pair of eyeglasses 24. The illustrated facial accessory 12 includes pliable material configured to be shaped and positioned about the pair of eyeglasses to generate a substantially continuous curtain of airflow in front a user's face.

[0088] In one non-limiting example, there is a clip-on (or other way for attachment) device that couples to a facial accessory and that includes a channeled and apertured structure that follows the structure of the facial accessory such that the apertures thereof may be distributed across the structure of the facial accessory. Such a device may be coupled to a top, bottom, and/or side, or combinations thereof of the facial accessory and may direct air distribution to a top, bottom, and/or side and/or combinations thereof. There may be a lanyard that may be coupled to the clip-on device and may include one or more modules described herein that may be disposed at an end region thereof and such may hang down therefrom and may be worn by a user in various manners, including but not limited to pending down the front of the user as a necklace, being worn on a shoulder, pending down a back of a user, and/or being coupled to a head of the user and/or to another facial accessory or other accessory.

[0089] FIG. 9 illustrates a pair of perspective views of a facial accessory system, according to one embodiment of the invention. There is shown a facial accessory system 10 including a facial accessory 12 having a channel 16 and an array of apertures 18 in communication with an airflow distribution device 22 and an air return device 36.

[0090] The illustrated facial accessory system 10 is configured to provide prophylactic face protection. The system 10 includes a facial accessory 12 coupled to a construction helmet configured to be worn on a user's head. The facial accessory 12 is in fluid communication with a channel 16, which is in fluid communication with an array of apertures 18 orientated and positioned to generate a substantially continuous curtain of airflow about a face of a user when air is forced therethrough.

[0091] The system 10 includes an airflow distribution device 22 coupled to a rear portion of a construction helmet, in fluid communication with the channel 16 of the facial accessory 12, wherein the airflow distribution device is configured to selectively force air to flow therethrough. The system 10 further includes an air return device 36 in fluid communication with the airflow distribution device 22. The air return device 36 includes a plurality of apertures 38 configured to intake air forced therethrough by the airflow distribution device 22.

[0092] FIG. 10 is a perspective view of a facial accessory system coupled to a hat, according to one embodiment of the invention. There is shown a facial accessory system 10 including an airflow distribution device 22 disposed about an earpiece region 44.

[0093] The illustrated facial accessory system 10 is configured to provide prophylactic face protection. The system 10 is coupled to a brim of a hat, wherein the system 10 includes a facial accessory 12 coupled thereto and configured to be worn about a head of a user. The facial accessory 12 includes a

channel disposed therethrough in fluid communication with an array of apertures **18** orientated and positioned to generate a substantially continuous curtain of airflow about a face of a user when air is forced therethrough. The system **10** includes an airflow distribution device **22** in fluid communication with the channel of the facial accessory **12** and configured to selectively force air to flow therethrough. The illustrated facial accessory **12** includes pliable material configured to be shaped and positioned to couple to a bottom portion of a brim of a hat to generate a substantially continuous curtain of airflow in front a user's face.

[0094] It is understood that the above-described embodiments are only illustrative of the application of the principles of the present invention. The present invention may be embodied in other specific forms without departing from its spirit or essential characteristics. The described embodiment is to be considered in all respects only as illustrative and not restrictive. The scope of the invention is, therefore, indicated by the appended claims rather than by the foregoing description. All changes which come within the meaning and range of equivalency of the claims are to be embraced within their scope.

[0095] For example, although the figures illustrate specific facial accessories of specific styles, the number of accessories and styles thereof are plethoric.

[0096] Additionally, although the figures illustrate substantially consistent arrays of apertures, it is understood that variant embodiments may include inconsistent arrays of apertures that may be inconsistent in aperture size, spacing, orientation, number of ranks of apertures and the like and combinations thereof.

[0097] It is expected that there could be numerous variations of the design of this invention. An example is that the tube illustrated in FIG. **8** that couples to the facial accessory could loop about the earpieces of the illustrated glasses a plurality of times.

[0098] Finally, it is envisioned that the components of the device may be constructed of a variety of materials, including but not limited to plastics, rubbers, ceramics, metals, woven fibers, composites, laminates, and the like and combinations thereof.

[0099] Thus, while the present invention has been fully described above with particularity and detail in connection with what is presently deemed to be the most practical and preferred embodiment of the invention, it will be apparent to those of ordinary skill in the art that numerous modifications, including, but not limited to, variations in size, materials, shape, form, function and manner of operation, assembly and use may be made, without departing from the principles and concepts of the invention as set forth in the claims. Further, it is contemplated that an embodiment may be limited to consist of or to consist essentially of one or more of the features, functions, structures, methods described herein.

What is claimed is:

1. A facial accessory system for prophylactic face protection, comprising:

- a) a facial accessory configured to be worn about the face of a user and including a channel therethrough in fluid communication with an array of apertures orientated and positioned to generate a substantially continuous curtain of airflow about a face of a user when air is forced therethrough; and

- b) an airflow distribution device in fluid communication with the channel of the facial accessory and configured to selectively force air to flow therethrough.

2. The system of claim **1**, wherein the facial accessory includes a pair of eyeglasses having the channel disposed throughout a frame of the pair of eyeglasses.

3. The system of claim **1**, wherein the airflow distribution device further comprises an air filter module in fluid communication with the channel and configured to filter air forced through the airflow distribution device.

4. The system of claim **1**, wherein the airflow distribution device further comprises an air additive module in fluid communication with the channel and configured to provide a fluid additive to the air forced through the airflow distribution device.

5. The system of claim **1**, wherein the airflow distribution device comprises

- a) a fan module configured to selectively force air to flow through the facial accessory; and
- b) a power module in communication with the fan module and configured to provide a power source to the modules and components of the air distribution device.

6. The system of claim **1**, further comprising an air return device in fluid communication with the airflow distribution device, including a plurality of apertures configured to intake air forced therethrough by the airflow distribution device.

7. The system of claim **1**, wherein the facial accessory is coupled to a bottom portion of a frame and about a temple and earpiece portion of a pair of eyeglasses.

8. The system of claim **1**, wherein the airflow distribution device is disposed within an earpiece portion of a pair of eyeglasses.

9. The system of claim **1**, wherein the substantially continuous curtain of airflow includes a wedge shaped cross-section of airflow about a face of a user.

10. The system of claim **6**, wherein the air return device and the facial accessory include a laser barrier system configured to direct a beam of coherent light between the air return device and the facial accessory.

11. A facial accessory device for prophylactic face protection, comprising:

- a) a facial accessory configured to be worn about the face of a user and including a channel therethrough in fluid communication with an array of apertures orientated and positioned to generate a substantially continuous curtain of airflow about a face of a user when air is forced therethrough; and
- b) an airflow distribution device in fluid communication with the channel of the facial accessory and configured to selectively force air to flow therethrough.

12. The device of claim **11**, wherein the facial accessory includes a pair of eyeglasses having the channel disposed throughout a frame of the pair of eyeglasses.

13. The device of claim **12**, wherein the airflow distribution device further comprises:

- a) an air filter module in fluid communication with the channel and configured to filter air forced through the airflow distribution device; and
- b) an air additive module in fluid communication with the channel and configured to provide a fluid additive to the air forced through the airflow distribution device.

14. The device of claim **13**, wherein the airflow distribution device comprises

- a) a fan module configured to selectively force air to flow through the facial accessory; and
- b) a power module in communication with the fan module and configured to provide a power source to the modules and components of the air distribution device.

15. The device of claim **14**, further comprising an air return device in fluid communication with the airflow distribution device, including a plurality of apertures configured to intake air forced therethrough by the airflow distribution device.

16. The device of claim **15**, wherein the facial accessory is coupled to a bottom portion of a frame and about a temple and earpiece portion of a pair of eyeglasses.

17. The device of claim **16**, wherein the airflow distribution device is disposed within an earpiece portion of a pair of eyeglasses.

18. The device of claim **17**, wherein the substantially continuous curtain of airflow includes a wedge shaped cross-section of airflow about a face of a user.

19. The device of claim **18**, wherein the air return device and the facial accessory include a laser barrier system configured to direct a beam of coherent light between the air return device and the facial accessory.

20. A facial accessory system for prophylactic face protection, comprising:

- a) a facial accessory configured to be worn about the face of a user and including a channel therethrough in fluid communication with an array of apertures orientated and

positioned to generate a substantially continuous curtain of airflow about a face of a user when air is forced therethrough;

- b) an airflow distribution device in fluid communication with the channel of the facial accessory and configured to selectively force air to flow therethrough; wherein the airflow distribution device comprises
 - b1) a fan module configured to selectively force air to flow through the facial accessory; and
 - b2) a power module in communication with the fan module and configured to provide a power source to the modules and components of the air distribution device;
- c) an air filter module in fluid communication with the channel and configured to filter air forced through the airflow distribution device;
- d) an air additive module in fluid communication with the channel and configured to provide a fluid additive to the air forced through the airflow distribution device; and
- e) an air return device in fluid communication with the airflow distribution device, including a plurality of apertures configured to intake air forced therethrough by the airflow distribution device; wherein the air return device and the facial accessory include a laser barrier system configured to direct a beam of coherent light between the air return device and the facial accessory.

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