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ABSTRACT

Various embodiments of air treatment devices (and housings therefor) are provided. The housings are substantially configured to provide air treatment devices that lessen the perceived size of the air treatment devices. Further, embodiments provide housings that are typically easier to clean and maintain and to provide ease in access to internal components of the air treatment devices. Embodiments may also position a control display associated with an air treatment device, such that the control display is visible from a position in front and above the air treatment device. Embodiments may also be configured to minimize and/or inhibit air exiting from the air outlet of the air treatment device from immediately reentering the air inlet and thus being recirculated.

2010200246 22 Jan 2010

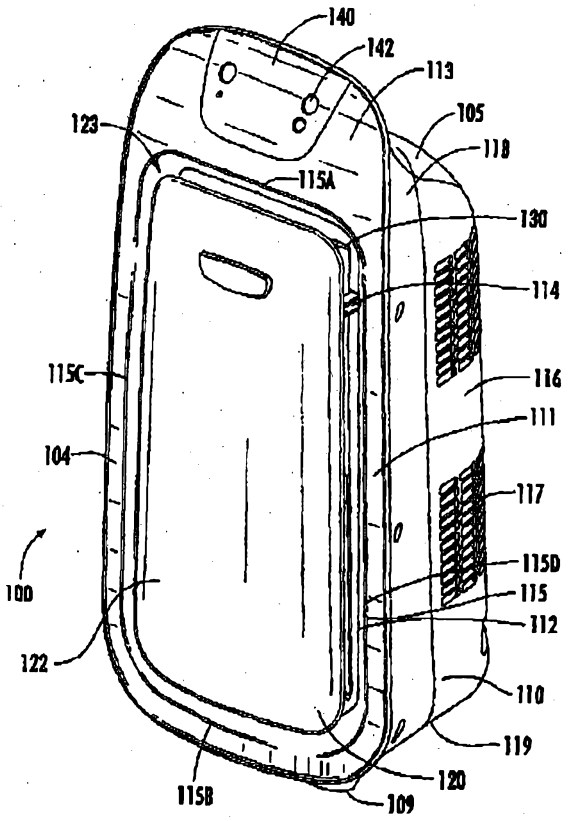

FIG. 1A

2010200246 22 Jan 2010

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COMPLETE SPECIFICATION

INVENTION TITLE:

AIR TREATMENT DEVICE AND HOUSING FOR AN AIR TREATMENT DEVICE

The following statement is a full description of this invention, including the best method of performing it known to us:-

2010200246 22 Jan 2010

AIR TREATMENT DEVICE AND HOUSING FOR AN AIR TREATMENT DEVICE

FIELD

In general, embodiments of the present invention relate to air treatment devices, such as fans, air purifiers, humidifiers, dehumidifiers, air conditioning units, etc. and more particularly, to housings for air treatment devices.

BACKGROUND

Air treatment devices, such as fans, air purifiers, humidifiers, de-humidifiers, air conditioning units, etc., typically comprise at least an inlet and an outlet and some form of air treatment such as a fan. Air treatment devices of various shapes and sizes are known. However, many, if not all, current air treatment devices have designs that do not adequately address current issues associated with their use and operation.

For example, many air treatment devices employ intake louvers for receiving air into the devices. These louvers collect dust particles located in the air and require frequent cleaning. Louvered structures, however, are generally difficult to clean. Spacing between louvers is typically narrow making cleaning dust from the louvers difficult.

Another issue noted with many conventional air treatment devices is that they do not adequately prevent air that exits the air outlet from immediately reentering the air treatment device through the air inlet. Recirculation of treated air into the device decreases the unit's capacity to receive untreated air.

An additional issue with many conventional air treatment devices is that their internal components are not easily accessible and are difficult to maintain and clean. One further issue is that many prior art air treatment devices are not aesthetically pleasing and appear bulky, obtrusive, or excessively imposing.

SUMMARY OF THE INVENTION

In one aspect, the present invention provides a housing for an air treatment device including:

a front portion;

2010200246 03 Jul 2012

a rear portion including first and second opposed exterior side surfaces respectively extending rearward from said front portion,

an air inlet located on said front portion; and

an air outlet located on said first exterior side surface of said rear portion, wherein said first exterior side surface of said rear portion includes a first curvature adjacent said front portion, wherein said first curvature is concave to thereby direct air flow from said air outlet away from said air inlet.

In another aspect, the present invention provides a housing for an air treatment device including:

a front portion;

a rear portion including first and second opposed exterior side surfaces respectively extending rearward from said front portion;

an air inlet located on said front portion; and

an air outlet located on said first exterior side surface of said rear portion, wherein said first and second exterior side surfaces of said rear portion include respective concave curves adjacent to said front portion and convex curves respectively adjacent the concave curves.

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BRIEF SUMMARY OF EMBODIMENTS OF THE PRESENT INVENTION

In general terms, embodiments of the present invention relate to air treatment devices, such as fans, air purifiers, humidifiers, de-humidifiers, air conditioning units, etc., including specifically-shaped housings for performing particular functions. For example, in one embodiment, a housing for an air treatment device is provided including a front portion and a rear portion. An air inlet is located on the front portion, and an air outlet is positioned on the rear portion. The rear portion includes first and second opposed side surfaces respectively extending rearward from the front portion. The first side surface includes a first curvature adjacent the front portion that is concave to thereby direct air flow from the air outlet away from the air inlet. In some embodiments, the first side surface of the rear portion includes a second curvature adjacent the first curvature, wherein the second curvature is convex. In a further embodiment, the air outlet is located on the second curvature of the first side surface.

In one embodiment, a housing for an air treatment device includes front and rear portions. The rear portion includes first and second opposed side surfaces respectively extending rearward from the front portion. An air inlet is located on the front portion, and an air outlet is located on the rear portion. The first and second side surfaces of the rear portion of this embodiment include respective concave curves adjacent to the front portion and convex curves respectively adjacent the concave curves. In some embodiments, the convex curves of the first and second side surfaces of the rear portion are adjacent to each other such that the first and second sides of the rear portion form a substantially bell-shaped curve.

In some embodiments, the first and second sides converge around a top of the rear portion, while maintaining the convex and concave combination of curves that define the bell-shaped curvature, to define a similarly curved top of the rear portion that flares upwardly and laterally outwardly as the top of the rear portion approaches the front portion. Further, in some embodiments, the bell-shaped curvature is positioned between an air outlet on the rear portion of the housing and an air inlet on the front portion of the housing, such that the shape and position of the bell-shaped curvature directs air flowing out of the air outlet away from the air inlet.

In another embodiment, a housing for an air treatment device has a curvature that extends from a first point positioned on an upper region of the front portion of the housing and continues upwardly and rearward to a second point positioned near a top perimeter of the front portion of the housing. The shape and location of the curvature makes the air treatment device aesthetically pleasing and appear slimmer from front to back than it would appear without the curvature. In other embodiments, the curvature also makes the air treatment device appear slim from side to side because the curvature diverges rearward as the front portion extends laterally away from a central region (or a plane of symmetry) of the housing. In some embodiments, the curvature is convex and diverges rearward as the front portion extends upwardly away from a bottom portion of the air treatment device. Additionally, in some embodiments, the curvature also includes at least a portion of a control display for use in operating at least one aspect of the air treatment device. The control display may be provided with an outer surface curvature that substantially conforms to the curvature of the housing such that the display is visible from both a frontward and upward direction.

In still another embodiment, an air treatment device includes a cowling releasably connected to the housing of the air treatment device. In some embodiments, the cowling is easily removable, thereby making itself and any internal components of the air treatment device easy to access, maintain, and/or clean. Also in some embodiments, the cowling is positioned relative to a recessed portion in the front portion of the housing, such that together the cowling and edges of the recessed portion define a substantially U-shaped opening to an air inlet for air to enter the air treatment device. For example, in one embodiment, the cowling abuts one of the edges of the recessed portion and is spaced apart from the other edges to thereby define a substantially U-shaped opening to an air inlet for air to enter the air treatment device. In many embodiments, the cowling also includes a curvature that may conform to one or more curvatures in the housing, such that the cowling smoothly transitions into the housing and helps the air treatment device appear sleek from front to back and/or from side to side.

In another embodiment, an air treatment device includes a power cord management system for storing a power cord associated with the air treatment device. In some embodiments, the power cord management system includes a slot extending into or through a portion of the housing in which the power cord may be at least partially inserted and/or stored. In another embodiment, the power cord management system includes a recessed portion and one or more knobs positioned in the recessed portion, such that a power cord associated with the device may be wrapped around the one or more knobs and stored at least partially within the recessed portion.

A housing for a portable air treatment device is also provided with a cavity in the housing for storage of a remote control. In one embodiment, the cavity is located on a rear portion of the housing so as to hide it from view.

BRIEF DESCRIPTION OF THE FIGURES

Having thus described embodiments of the invention in general terms, reference will now be made to the accompanying figures, which are not necessarily drawn to scale, and wherein:

Figure 1A illustrates a top, front, and right side perspective view of a first embodiment of an air treatment device;

Figure 1B illustrates a right side elevational view of Figure 1A;

Figure 1C illustrates a top plan view of Figure 1A;

Figure 1D illustrates a front elevational view of Figure 1A;

Figure 1E illustrates a rear elevational view of Figure 1A;

Figure 1F illustrates a left side elevational view of Figure 1A;

Figure 1G illustrates a bottom plan view of Figure 1A;

Figure 1H illustrates a top, front, and right side perspective view of the embodiment of Figure 1A without the cowling;

Figure 2A illustrates a top, front, and right side perspective view of a second embodiment of an air treatment device;

Figure 2B illustrates a right side elevational view of Figure 2A;

Figure 2C illustrates a top plan view of Figure 2A;

Figure 3A illustrates a top, front, and right side perspective view of a third embodiment of an air treatment device;

Figure 3B illustrates a right side elevational view of Figure 3A;

Figure 3C illustrates a top plan view of Figure 3A;

Figure 4A illustrates a top, front, and right side perspective view of a fourth embodiment of an air treatment device;

Figure 4B illustrates a right side elevational view of Figure 4A;

Figure 4C illustrates a top plan view of Figure 4A;

Figure 4D illustrates a rear elevational view of Figure 4A;

Figure 5A illustrates a top, front, and right side perspective view of a fifth embodiment of an air treatment device;

Figure 5B illustrates a right side elevational view of Figure 5A; and

Figure 5C illustrates a top plan view of Figure 5A.

DETAILED DESCRIPTION OF EMBODIMENTS OF THE PRESENT INVENTION

Embodiments of the present invention now will be described more fully herein with reference to the accompanying drawings, in which some, but not all, embodiments of the invention are shown. Indeed, the present invention may be embodied in many different forms and should not be construed as limited to the embodiments set forth herein; rather, these embodiments are provided so that this disclosure will satisfy applicable legal requirements. Where possible, any terms expressed in the singular form herein are meant to also include the plural form, and vice versa. Also, as used herein, the terms "a" and/or "an" shall mean "one or more," even though the phrase "one or more" is also used herein. Like numbers and letters refer to like elements throughout.

It will be understood that in most of the embodiments described herein, the air treatment device is for air purification purposes and has a housing including an air inlet and an air outlet, a fan assembly positioned within the housing for directing air into the air inlet and out of the air outlet, and a purification system positioned within the housing for at least partially purifying, filtering, and/or cleaning the air that enters the device. In these embodiments, the purification system may include, for example, any one or more of the following: one or more filters, such as one or more high efficiency particulate air (HEPA) filters, carbon filters, and/or pre-filters; one or more photocatalytic oxidation purification systems; one or more ultraviolet (UV)

light purification systems, such as UV-C bulb systems and/or ultraviolet germicidal irradiation (UVGI) systems; and/or one or more air and/or liquid ionizer purification systems, etc. Additionally, it will be understood that one or more embodiments of the present invention may have clean air delivery rates (CADRs) of 100, 125, 150, 200, and/or 280, as certified by the Association of Home Appliance Manufacturers (AHAM). At the same time, it will also be understood that some embodiments of the present invention may be used for purposes other than, or in addition to, air purification, including, for example, circulation, ventilation, blowing, heating, cooling, humidifying, and/or dehumidifying of air.

Referring now to a more detailed example, Figures 1A-1H provide various views of a housing **110** for an air treatment device **100**, in accordance with an embodiment of the present invention. As shown in one or more of these views, the air treatment device **100** includes a housing **110**, a cowling **120**, one or more filters **130**, and a control display **140**. The housing **110** further includes a front portion **111** including a first front curvature **113**, a second front curvature **104**, and an air inlet **123** including a recessed portion **112**. The recessed portion **112** includes one or more connectors **114** and upper, lower, and opposed side edges **115A-115D**. The housing **110** also includes a rear portion **116** including one or more air outlets **117**, a first rear curvature **105**, a second rear curvature **118** including first, second, third, and fourth curvature regions **118E-118H**, a power cord management system **106**, one or more fasteners **107**, a handle **108**, and a bottom portion **119** including one or more bases **109**. The power cord management system **106** further includes a power cord **106A** and a slot **106B** including a first slot portion **106C** and a second slot portion **106D**. The power cord managements system is discussed in greater detail below. The control display **140** further includes one or more control display buttons **142**.

It will be understood that the housing **110** of the air treatment device **100** is the body in which most of the components of the air treatment device **100** are positioned. In some embodiments, the housing **110** is plastic and is assembled using a plurality of fasteners. However, in other embodiments, the housing **110** may be formed from and/or assembled with any other materials and/or objects sufficient to support the components and/or perform the functions of the air treatment devices described herein.

It will also be understood that the housing **110** may be configured differently in other embodiments to perform the same or similar functions described herein. As one example, in some embodiments, the air treatment device **100** may be arranged so that the recessed portion **112**, with or without the cowling **120**, can define an air outlet, and/or the features that define air outlet **117** may serve as an air inlet.

As illustrated, the housing **110** of the embodiment illustrated in Figures 1A-1H has a first front curvature **113** that is positioned at least partially above the recessed portion **112** on the front portion **111**. In other embodiments, the first front curvature **113** may be positioned at least partially alongside, below, and/or within the recessed portion **112** and/or vice versa. As shown in Figure 1B, the first front curvature **113** extends from the first point **113A** positioned near a central region of front portion **111** and continues upwardly and backwardly to a second point **113B** positioned near a top perimeter of the front portion **111**.

As a source of reference only, Figure 1B also depicts a vertical reference plane **VRP**, which may be defined at an exemplary forward-most point **FMP** on the front portion **111**. In some embodiments, as shown in Figure 1B, the first front curvature **113** curves further away from the vertical reference plane **VRP** as the front portion **111** extends vertically upwards in a direction away from the bottom portion **119**. Additionally, the front portion **111** may be configured so that the first front curvature **113** diverges away from the vertical reference plane **VRP** at a more pronounced or substantial rate than the rest of the front portion **111**. Further, in some embodiments, the first front curvature **113** curves around a substantially horizontal axis positioned in the housing **110**, such that the first front curvature **113** may be characterized as convex as viewed from the exterior of the housing **110**.

As shown in Figure 1C, in some embodiments, the first front curvature **113** may also extend laterally outwardly and backwardly. The first front curvature **113** may be substantially symmetrical about a plane of symmetry **POS** that runs through the middle of the housing **110** and that is substantially perpendicular to the vertical reference plane **VRP**. The first front curvature **113** of one embodiment curves backwardly so as to diverge further away from the vertical reference plane **VRP** as the front portion **111** extends laterally away from the plane of symmetry **POS**. The first front curvature **113** presents an aesthetically pleasing shape and tends to make

the housing **110** appear less imposing or obtrusive than it would appear without the first front curvature **113**. The first front curvature **113** also provides a convenient-to-view and convenient-to-access location for at least a portion of the control display **140**.

The control display **140** has one or more control display buttons **142** that allow a user to control one or more aspects of the air treatment device **100**, including, for example, various fan speeds, sleep timers, clocks, various rotation settings, and/or various mode settings, etc. It will be understood that the control display button(s) **142** may include one or more pushbuttons, knobs, haptic interfaces, and/or anything else that allows users to control at least one aspect of the air treatment device **100**. In some embodiments, the control display **140** may also include control functions for one or more air characteristic sensors (e.g., air quality sensors, air humidity sensors, air temperature sensors, etc.), replace filter indicators, UV light purification sensors, and/or remote control sensors, etc. that may be part of the air treatment device. The control display **140** may also output information in one or more ways, including via liquid crystal displays (LCDs), light emitting diodes (LEDs), digital displays, analog displays, video displays, laser displays, segment displays, electronic displays, and/or any other visual displays, etc.

In many embodiments, the control display **140** includes an outer curvature that substantially conforms to the shape of the first front curvature **113**, such that the display **140** is substantially viewable from a position in front of the display and a position above the display. In this configuration, at least one of the control buttons on the control display **140** is also viewable in these directions, making it easy for a user to view and access. It will be understood that other embodiments may include a control display having a different type, size, shape, and/or positioned in a different location than that of the control display **140** depicted in Figures 1A-1H.

Referring now to Figure 1C, the housing **110** includes a second front curvature **104** extending from a first point **104A** positioned near a central region of the front portion **111** and continuing laterally outwardly and backwardly (away from the vertical reference plane **VRP**) to a second point **104B** positioned near an outer perimeter of the front portion **111**. In many embodiments, including the one shown in Figure 1C, the second front curvature **104** also extends from the first point **104A**

laterally outwardly and backwardly in a direction substantially opposite from the second point **104B**, such that the second front curvature **104** is substantially symmetrical about the plane of symmetry **POS** that runs through the middle of the housing **110** and that is substantially perpendicular to the bottom portion **119**. In some embodiments, the second front curvature **104** curves around a substantially vertical axis positioned in the housing **110**, such that the second front curvature **104** may be characterized as convex as viewed from the exterior of the housing **110**. Also in some embodiments, as shown in Figure 1B, the second front curvature **104** may curve further away from the vertical reference plane **VRP** as the front portion **111** extends laterally away from the plane of symmetry **POS** and also as it extends vertically up in a direction away from the bottom portion **119**.

Referring again to Figure 1B, the housing **110** also includes a first rear curvature **105** that is positioned substantially near a top of the rear portion **116**. As shown, the first rear curvature **105** extends from a first point **105A** positioned near a rear perimeter of the rear portion **116** and continues upwardly and forwardly to a second point **105D** near a top perimeter of the rear portion **116**. In some embodiments, the second point **113B** of the front portion **111** and the second point **105D** may be positioned in the same location on the housing **110**.

In this particular embodiment, the first rear curvature **105** includes two curvature regions **105E** and **105F**, but in other embodiments, the first rear curvature **105** may include more or fewer curvature regions. The first curvature region **105E** of the first rear curvature **105** extends from the first point **105A** positioned near the rear perimeter of the rear portion **116** and continues upwardly and forwardly to a second point **105B** positioned on the perimeter of rear portion **116**. The first curvature region **105E** curves around a substantially horizontal axis positioned within the housing, such that the region **105E** may be characterized as convex as viewed from the exterior of the housing **110**. The second curvature region **105F** of the first rear curvature **105** extends from a third point **105C** on the perimeter of the rear portion **116** and continues upwardly and forwardly to a fourth point **105D** positioned near a top perimeter of the rear portion **116**. The second curvature region **105F** curves around a substantially horizontal axis positioned outside of the housing,

such that the region **105F** may be characterized as concave as viewed from the exterior of the housing **110**.

In some embodiments, the second point **105B** and the third point **105C** may be positioned at the same location on the perimeter of the rear portion **116**. Also in some embodiments, as shown in Figures 1B and 1C, the first rear curvature **105** may also extend outwardly and forwardly (or flare), such that the first rear curvature **105** is substantially symmetrical about the plane of symmetry **POS** that runs through the middle of the housing **110** and is substantially perpendicular to the bottom portion **119**. Further, in some embodiments, the first rear curvature **105** curves around a substantially horizontal axis positioned outside of the housing **110**, such that the first rear curvature **105** as a whole may be characterized as concave as viewed from the exterior of the housing **110**.

As also shown in Figure 1C, the housing **110** also includes a second rear curvature **118** that is positioned on the rear portion **116** and, when viewed from above the housing **110**, substantially resembles a bell-shaped curve. In some embodiments, as shown in Figure 1C, the second rear curvature **118** flares outwardly as it approaches the front portion **111**. Also, in this particular embodiment, the second rear curvature **118** includes four curvature regions **118E-118H**, but in other embodiments, the second rear curvature **118** may include more or fewer curvature regions. These four illustrated curvature regions **118E-118H** define exterior side walls of the rear portion **116** that extend rearward from the front portion **111** of the housing **110** and converge to define the rear portion **116** of the housing **110**. The first region **118E** of the second rear curvature **118** extends from a first point **118A** positioned at or near a junction of the front and rear portions **111**, **116** and continues rearward to a second point **118B** positioned on the perimeter of rear portion **116**. The first curvature region **118E** curves around a substantially vertical axis positioned outside of the housing, such that the region **118E** may be characterized as concave as viewed from the exterior of the housing **110**. The second curvature region **118F** of the second rear curvature **118** extends from a third point **118C** on the perimeter of the rear portion **116** and continues rearward to a fourth point **118D** positioned near a furthermost rear point on the rear portion **116**. The second curvature region **118F** curves around a substantially vertical axis positioned in the housing **110**, such that

the region **118F** may be characterized as convex as viewed from the exterior of the housing **110**.

In some embodiments, the second point **118B** and the third point **118C** may be positioned at the same location on the perimeter of the rear portion **116**. Further, as illustrated in Figure 1C, the first point **118A** may be located at the junction of the front and rear portions **111, 116** and/or there may be a fillet **118K** between the first point **118A** and the front portion **111**.

In the illustrated embodiment of Figures 1A-1H, at least a portion of the first rear curvature **105** and at least a portion of the second rear curvature **118** are positioned between the air outlet **117** and the air inlet **123**. This helps deflect air from the air outlet **117** substantially away from the air inlet **123** and tends to prevent or inhibit air flowing out of the air outlet **117** from immediately reentering the air inlet **123** of the housing **110**. For example, as shown in many of the Figures 1A-1H, the air outlet **117** is located on the second curvature region **118F** defined between points **118B** and **118D** of the second rear curvature **118**. Accordingly, in this embodiment, one or more of the first rear curvature **105**, the first curvature region **118E**, the second curvature region **118F**, and/or a combination of the two curvature regions **118E, 118F** inhibit air escaping the air outlet **117** from immediately reentering the housing **110** through the air inlet **123**.

In some embodiments, including the one shown in Figures 1A-1H, the first and second curvature regions **118E, 118F** of the second rear curvature **118** are positioned on a first side of the rear portion **116** of the housing **110**. In some embodiments, the opposed second side of the rear portion **116** includes the third and fourth curvature regions **118G, 118H**, and those curvature regions **118G, 118H** are configured so that they substantially mirror the first and second curvature regions **118E, 118F**. In these embodiments, the rear portion **116** has a substantially bell-shaped curvature that is substantially symmetrical about the plane of symmetry **POS** that runs through the middle of the housing **110** and that is substantially perpendicular to the bottom portion **119**.

Further, it will be understood that, in some embodiments, the second rear curvature **118**, like the first front curvature **113**, second front curvature **104**, and/or first rear curvature **105**, may extend through one or more planes substantially parallel

to the bottom portion **119**, through one or more planes substantially perpendicular to the bottom portion **119**, and/or through one or more planes in between. Accordingly, in some embodiments, including the one shown in Figures 1A-1H, the first front curvature **113** may smoothly transition into the second front curvature **104** and/or vice versa, and/or the first rear curvature **105** may smoothly transition into the second rear curvature **118** and/or vice versa. Because of the contours and positions of these curvatures, the housing **110** is aesthetically pleasing and helps an air treatment device **100** appear slim from front to back and/or from side to side. It is noted that other embodiments of the present invention may include the same and/or one or more additional curvatures extending in more, fewer, and/or different directions.

As shown in many of the Figures 1A-1H, the front portion **111** of the housing **110** also includes an air inlet **123** through which air enters the air treatment device **100**. In one embodiment, the air inlet **123** includes the recessed portion **112** including upper, lower, and opposed side edges **115A-115D**, and in some embodiments, as shown in Figure 1H, the air inlet **123** also includes one or more filters **130**. Further, in some embodiments, a cowling **120** is releasably connected to the housing **110** via one or more connector(s) **114** to at least partially define the air inlet **123**. The cowling **120** may also substantially cover one or more filter(s) **130** located in the air inlet **123**. In the embodiment of the housing **110** illustrated Figures 1A-1H, the cowling **120** is positioned relative to the recessed portion **112**, such that together the cowling **120** and the edges **115A-115D** of the recessed portion **112** define a quasi-rectangular and quasi-O-shaped opening to the air inlet **123** for air to enter the housing **110**. In other embodiments, however, the opening may be of a different size and/or shape, including, for example, the quasi-U-shaped openings shown in the embodiments illustrated in Figures 4 and 5 and discussed further herein.

In some embodiments, as shown in many of the views of the housing **110**, the cowling **120** has a cowling curvature **122**. In some embodiments, when the cowling is releasably connected to the housing **110**, the cowling curvature **122** curves around a substantially vertical axis positioned in the housing **110**, such that the cowling curvature **122** may be characterized as convex as viewed from the exterior of the housing **110**. In another embodiment, the cowling curvature **122** curves around a

substantially horizontal axis positioned in the housing **110**, such that the cowling curvature **122** may be characterized as convex as viewed from the exterior of the housing **110**.

In some embodiments, the cowling curvature **122** may also be substantially symmetrical about the plane of symmetry **POS** that runs through the middle of the housing **110**. In still other embodiments, the cowling curvature **122** may also be substantially symmetrical about other planes that are substantially perpendicular to the bottom portion **119**, substantially parallel to the bottom portion **119**, and/or about one or more planes in between. Further, as shown in Figures 1A-1C, the shape of the cowling curvature **122** may conform to the first front curvature **113** and/or the second front curvature **104**, such that the cowling curvature **122** would smoothly transition into the first front curvature **113** and/or the second front curvature **104** if the opening to the air inlet **123** did not exist in the front portion **111** between the edges **115A-115D** and the cowling **120**. The cowling curvature **122** also complements the other curvatures **113**, **104**, **105**, and **118** to achieve a functional housing shape that also is aesthetically pleasing, helps the air treatment device **100** appear more graceful and sleek, and provides the air treatment device **100** with a slim and less obtrusive appearance from front to back and/or from side to side.

Referring now to Figure 1G, a bottom view of the housing **110** is depicted. The bottom portion **119** of the housing **110** includes one or more bases or feet **109**. The base or bases **109** are structured and positioned to support the housing **110** on a support surface. In some embodiments, the base or bases **109** are structured for proper placement on a mesh support surface such as a mezzanine floor or a display rack where the support surface includes spaced apart holes. In these instances, improper spacing or sizing of a base or bases on the housing may cause one or more of the bases to be located in a hole of the perforated or mesh support surface causing the housing to not sit level on the support surface.

To address this issue, as depicted in Figure 1G, in some embodiments, the housing **110** may include one or a plurality of bases **109** that are sized so as to have a dimension that is larger than a dimension of the holes in the support surface, such that the bases contact the edges of the holes in the support surface on which each base rests. Note, that many perforated or mesh support surfaces may have holes with

multiple dimensions. For example, if the holes are square-shaped, the diagonal dimension of the hole will be larger than the side dimensions of the hole. As such, in some embodiments, the bases **109** are sized to be larger than the largest dimension of the holes of a given support surface to prevent the bases from inserting into the holes and making the housing unlevel. This allows the housing **110** to be placed in various orientations on the support surface while maintaining the housing **110** at a level orientation relative to the support surface.

As also depicted in Figure 1G, in one embodiment, the housing **110** may include one or more bases **109** that are of a non-square or non-circular shape, such as oval in shape. This also allows the housing to be placed into different orientations on the mesh support surface in a level position, as the bases **109** are shaped and sized to span a dimension of the holes so as to rest on the edges of the holes in the support surface.

As also depicted in Figure 1G, in one embodiment, the housing **110** may include one or more bases **109** that are spaced apart in a non-square or non-rectangular configuration. For example, as demonstrated by the dotted line the bases may be spaced in a triangular configuration. Other configurations such as trapezoidal, rhombus, etc. are contemplated.

As also depicted in Figures 1F and 1G, in one embodiment, the housing **110** may include one or more bases **109** that include a first end **109A** for connection to the housing bottom portion **119** and a second opposed end **109B** for contacting the support surface. The first and second opposed ends are spaced apart by one or more sidewalls **109C**. The first end **109A** has a larger lateral dimension than the second opposed end **109B**, and the sidewalls **109C** are tapered or drafted from the first end **109A** to the second end **109B**. In this manner, the first end **109A** of each base can be placed further apart on the bottom portion **119** of the housing **110** and taper so as to create a smaller "foot print" for contacting the support surface.

As illustrated in Figures 1B, 1C, 1E, and 1F, the housing **110** includes a handle **108** for lifting and carrying the unit. In some embodiments, the handle **108** is positioned vertically, horizontally, or both vertically and horizontally relative to the distribution of weight of the materials and components on and inside each device, so that when each device is lifted by its handle **108** the device has very little, or no,

tendency to pivot about the handle. This tends to keep each device substantially upright when being lifted and can make movement of the devices from one location to another much less clumsy and much less likely to result in tipping or bumping of the devices. Following the general concept that an object will balance when its center of gravity (i.e., the position where all of its mass, on the average, resides) is directly over or under the point of support, the weight of the unit is substantially balanced relative to the placement of the handle **108**.

Referring now to Figure 1H, a perspective view of housing **110** is provided with the cowling **120** removed. As shown, the housing **110** includes four connectors **114** for releasably connecting the cowling **120** to the housing **110**. In this embodiment, the connectors **114** are plastic clips for receiving corresponding portions of the cowling **120** (not shown), but other embodiments may include different types, sizes, and/or numbers of fasteners for performing the same function, and/or those fasteners may be positioned differently.

With the cowling **120** removed, Figure 1H also illustrates two filters **130** positioned in the air inlet **123** within the housing **110**. The filters **130** are arranged so as to purify air that passes in substantially the same direction through the filters **130**. In this embodiment, the filters **130** are HEPA filters and one is positioned above the other and offset such that the front-facing surfaces of the filters **130** are not coplanar. This offset **132** may be achieved, for example, by appropriately disposing one or more filter stops **132A** on an inside wall of the housing **110**. The filter stops **132A** may be molded or otherwise formed integrally with the housing **110** or may be added thereto. The filter stops **132A** may be provided, for example, at different depths into the housing **110** or with differing thicknesses to provide the desired amount of offset **132**.

The offset **132** allows at least one of the filter side surfaces **133** to protrude beyond the side surface of the other filter **130** when the filters **130** have substantially the same filter thickness. This configuration facilitates removal of the filters **130**. For example, for peripherally supported (or perimeter-enclosed) filters, one or more exposed side surfaces **133** of each offset filter **130** provide a convenient and sturdy surface that may be gripped to pull out and remove the filter **130**. The removal of one filter **130** in this manner leaves the side surface of the other filter **130** exposed to

facilitate removal of that filter **130**. This offset arrangement avoids the need for different thicknesses of filters or special moldings or finger holes on the sides of the filters **130**. It also makes it less likely that, in the absence of such moldings or finger holes, a user will need to pinch the potentially dirty filter media in order to remove a filter **130** for replacement.

It will be understood that other embodiments may include different types, sizes, and/or numbers of filters, and/or those filters may be positioned differently. In addition and as mentioned previously, some embodiments may not have a filter or any purification system, depending on the intended use for the air treatment device.

Figure 1H also illustrates that removing the cowling **120** leaves the recessed portion **112**, filters **130**, and the connectors **114** exposed and easily accessible for cleaning, maintaining, and/or removal from the housing **110**. This aspect of this embodiment of the present invention is different from many conventional air treatment devices that are configured in ways that make them difficult to access, maintain, and/or clean. When the cowling **120** is removed, the illustrated arrangement presents fewer, if any, surfaces that are difficult to reach or clean when compared to conventional air treatment devices that employ, for example, louvers, inlet slits, grills, and/or other intricate features with small and difficult-to-reach dirt-collecting surfaces.

Referring again to Figures 1B, 1E, and 1F, the housing **110** also includes a power cord management system **106**, in accordance with an embodiment of the present invention. As shown, the power cord management system **106** includes a power cord **106A** and a slot **106B**. The slot **106B** extends either partially or entirely through a portion of the housing **110**. The slot **106B** includes a first slot portion **106C** and a second slot portion **106D**. The power cord **106A** is operable to transfer power from a power source (not shown) to one or more portions of the air treatment device **100**. The slot **106B** is operable to at least partially secure, contain, support, and/or store at least a portion of the power cord **106A** within at least a portion of the slot **106B**. In operation, according to one embodiment, the power cord management system **106** is structured so that a user may wrap, bundle, bunch, and/or otherwise collect the power cord **106A** and position at least a portion of the power cord **106A** at least partially within the slot **106B**. In one embodiment, the power cord **106A** may

be inserted into the slot **106B** near the first slot portion **106C** and then pushed, pulled, and/or otherwise moved towards the second slot portion **106D**, and/or vice versa. The power cord management system **106** aids in protecting the power cord **106A** from damage when the unit is not in use. The power cord management system **106** also complements the shape of the air treatment device **100** so as to effectively and neatly maintain and/or retain the power cord **106A** without substantially visually impacting the aesthetic design of the air treatment device **100**.

Further, it will be understood that the slot **106B** may include any shape, any size, and/or may be positioned anywhere on and/or in the housing **110**. For example, as shown in Figures 1B, 1E, and 1F, the slot **106B** is positioned near a lower portion of the rear portion **116** and includes an elongated shape and a substantially rectangular cross-section. In addition, the slot **106B** extends all of the way through the rear portion **116**, such that the power cord **106A** may be inserted into an opening adjacent the first slot portion **106C** or an opening adjacent the second slot portion **106D**. Also, the slot **106B** extends substantially straight through the rear portion **116** from the first slot portion **106C** towards the second slot portion **106D**. In addition, as shown in Figure 1B, 1E, and 1F, the slot **106B** may extend in a direction substantially parallel to the vertical reference plane **VRP** and/or in a direction substantially perpendicular to the plane of symmetry **POS**. Further, it will be understood that, in some embodiments, one or more portions of the slot **106B** may substantially conform to one or more of the curvatures of the housing **110**, including, for example, the first front curvature **113**, the second front curvature **104**, the first rear curvature **105**, and/or the second rear curvature **118**. Also, as shown, the slot **106B** may be integral with, and/or formed from the same materials as, the rear portion **116**.

However, it will be understood that the slot **106B** may include different dimensions in other embodiments, including, for example, having a curved shape, a circular cross section, an orientation substantially perpendicular to the vertical reference plane **VRP**, and/or the like. It will also be understood that, in some embodiments, the slot **106B** may be structured to store all or nearly all of the power cord **106A** entirely within the slot **106B**. In other embodiments, the slot **106B** may be at least partially defined by, located on and/or in, and/or positioned on and/or in

some other portion of the housing **110** in addition to, or instead of, the rear portion **116**. Still further, in some embodiments, the slot **106B** may be distinct from the rear portion **116** and/or be formed from one or more materials other than, or in addition to, those used to form the rear portion **116** and/or other portions of the housing **110**. Also, it will be understood that, in some embodiments, the slot **106B** may not extend all of the way through the rear portion **116**, i.e. the slot **106B** may have only a single opening through which the power cord **106A** may be inserted.

It will be understood that advantages, features, and operational aspects of the foregoing embodiment may be included in other housing configurations, examples of which are described hereinafter.

Referring now to Figures 2A-2C, a housing **210** for use with an air treatment device **200** is provided, in accordance with an embodiment of the present invention. The housing **210** includes a front portion **211**, a rear portion **216**, and a bottom portion **219**. The front portion **211** includes a first front curvature **213**, a second front curvature **204**, and an air inlet **223** including a recessed portion **212**. The recessed portion **212** includes one or more connectors **214** and upper, lower, and opposed side edges **215A-215D**. The rear portion **216** includes an air outlet **217**, a first rear curvature **205**, a second rear curvature **218**, a handle **208**, and a bottom portion **219** including one or more bases **209**. Though not shown, the housing **210** may also include one or more purification systems, as described herein. In addition, the housing **210** may also include a cowling **220** including a cowling curvature **222**, and a control display **240** including one or more control display buttons **242**. It will also be understood that, like the housing **110** of Figures 1A-1H, the housing **210** of this embodiment may also include a power cord for delivering power to the device, a power cord management system for storing a power cord associated with the device, and/or one or more fasteners for assembling the device.

As shown in Figure 2B, the first front curvature **213** extends from the first point **213A** positioned near a central region of the front portion **211** and continues upwardly and backwardly to the second point **213B** positioned near a top perimeter of the front portion **211**. As a source of reference only, Figure 2B also depicts a vertical reference plane **VRP**, which may be defined at an exemplary forward-most point **FMP** on the front portion **211**. In some embodiments, the first front curvature

213 curves away from the vertical reference plane **VRP** as the front portion **211** extends vertically upwards in a direction away from the bottom portion **219**. Additionally, the first front curvature **213** may diverge away from the vertical reference plane **VRP** at a more pronounced or substantial rate than the rest of the front portion 211. Further, in some embodiments, the first front curvature **213** curves around a substantially horizontal axis running through the housing **210**, such that the first front curvature **213** may be characterized as convex as viewed from the exterior of the housing **210**.

As shown in Figure 2C, in some embodiments, the first front curvature **213** may also extend laterally outwardly and backwardly. The first front curvature **213** may be substantially symmetrical about a plane of symmetry **POS** that runs through the middle of the housing **210** and that is substantially perpendicular to the vertical reference plane **VRP**. The first front curvature **213** of one embodiment curves backwardly so as to diverge further away from the vertical reference plane **VRP** as the front portion **211** extends laterally away from the plane of symmetry **POS**. The first front curvature **213** presents an aesthetically pleasing shape and tends to make the housing **210** appear less imposing or obtrusive than it would appear without the first front curvature **213**. The first front curvature **213** also provides a convenient-to-view location for at least a portion of the control display **240**.

Figure 2B also illustrates the first rear curvature **205** extending from a first point **205A** positioned near a rear perimeter of the rear portion **216** and continuing upwardly and forwardly to the second point **205B** near a top perimeter of the rear portion **216**. In one embodiment, the first rear curvature **205** curves around a substantially horizontal axis positioned outside of the housing **210**, such that the first rear curvature **205** may be characterized as concave as viewed from the exterior of the housing **210**. In another embodiment, the second point **213B** of the front portion **211** and the second point **205B** of the rear portion **216** may be positioned in the same location on the housing **210**. Also in another embodiment, the first rear curvature **205** may also extend outwardly and forwardly (or flare), such that the first rear curvature **205** is substantially symmetrical about the plane of symmetry **POS** that runs through the middle of the housing **210** and that is substantially perpendicular to the bottom portion **219**.

As shown in Figure 2C, the second front curvature **204** extends from the first point **204A** positioned near a central region of front portion **211** and continues laterally outwardly and backwardly (away from the vertical reference plane **VRP**) to the second point **204B** positioned near an outer perimeter of the front portion **211**. In many embodiments, including the one shown in Figure 2C, the second front curvature **204** also extends from the first point **204A** laterally outwardly and backwardly in a direction substantially opposite from the second point **204B**, such that the second front curvature **204** is substantially symmetrical about the plane of symmetry **POS** that runs through the middle of the housing **210** and that is substantially perpendicular to the bottom portion **219**. In some embodiments, the second front curvature **204** curves around a substantially vertical axis positioned in the housing **210**, such that the second front curvature **204** may be characterized as convex as viewed from the exterior of the housing **210**. As shown in Figure 2B, the second front curvature **204** may also diverge or curve away from the vertical reference plane **VRP** as the front portion **211** extends vertically up in a direction away from the bottom portion **219**.

Also shown in Figure 2C is a second rear curvature **218**, which extends from the first point **218A** positioned near a rear perimeter of the rear portion **216** and continues forwardly and outwardly (or flares out) to the second point **218B** positioned near a front edge of the rear portion **216**. In some embodiments, including the one shown in Figure 2C, another curvature **218'** that substantially mirrors the second rear curvature **218** is positioned on a substantially opposite side of the housing **210**, such that the housing **210** is substantially symmetrical about the plane of symmetry **POS** that runs through the middle of the housing **210** and that is substantially perpendicular to the bottom portion **219**. In some embodiments, the second rear curvature **218** curves around a substantially vertical axis positioned outside of the housing **210**, such that the second rear curvature **218** may be characterized as concave as viewed from the exterior of the housing **210**. Likewise, in some embodiments, the curvature **218'** curves around a substantially vertical axis positioned outside of the housing **210**, such that the curvature **218'** may be characterized as concave as viewed from the exterior of the housing **210**.

As with the embodiment shown in Figures 2A-2C, it will be understood that at least a portion of the first rear curvature **205** and at least a portion of the second rear curvature **218** are positioned between the air outlet **217** and the air inlet **223**. This helps deflect air from the air outlet **217** substantially away from the air inlet **223** and tends to prevent or inhibit air flowing out of the air outlet **217** from immediately reentering the air inlet **223** of the housing **210**. Further, it will be understood that, in some embodiments, the second rear curvature **218**, like the first front curvature **213**, the second front curvature **204**, and/or the first rear curvature **205**, may extend through one or more planes substantially parallel to the bottom portion **219**, through one or more planes substantially perpendicular to the bottom portion **219**, and/or through one or more planes in between. Accordingly, in some embodiments, including those shown in Figures 2A-2C, the first front curvature **213** may smoothly transition into the second front curvature **204** and/or vice versa, and/or the second rear curvature **218** may smoothly transition into the first rear curvature **205** and/or vice versa.

As shown in Figures 2A-2C, the housing **210** may have a cowling **220** including a cowling curvature **222**. In some embodiments, when the cowling is releasably connected to the housing **210**, the cowling curvature **222** curves around a substantially vertical axis positioned in the housing **210**, such that the cowling curvature **222** may be characterized as convex as viewed from the exterior of the housing **210**. In another embodiment, the cowling curvature **222** curves around a substantially horizontal axis positioned in the housing **210**, such that the cowling curvature **222** may be characterized as convex as viewed from the exterior of the housing **210**.

In some embodiments, the cowling curvature **222** may also be substantially symmetrical about the plane of symmetry **POS** that runs through the middle of the housing **210**. In still other embodiments, the cowling curvature **222** may also be substantially symmetrical about other planes that are substantially perpendicular to the bottom portion **219**, substantially parallel to the bottom portion **219**, and/or about one or more planes in between. Further, as shown in Figures 2A-2C, the shape of the cowling curvature **222** may conform to the first front curvature **213** and/or the second front curvature **204**, such that the cowling curvature **222** would smoothly transition

into the first front curvature **213** and/or the second front curvature **204** if the opening to the air inlet **223** did not exist in the front portion **211** between the edges **215A-215D** and the cowling **220**. The cowling curvature **222** complements the other curvatures **213, 204, 205,** and **218** to achieve a functional housing shape that also is aesthetically pleasing, helps the air treatment device **200** appear more graceful and sleek, and provides the air treatment device **200** with a slim and less obtrusive appearance from front to back and/or from side to side.

In many embodiments, the control display **240** includes an outer curvature that substantially conforms to the shape of the first front curvature **213**, thereby allowing the display **240** to be viewed from a position in front of and level with the display **240** and/or from a position in front of and above the display **240**. In this configuration, at least some of the information and control buttons **242** on the control display **240** are also projected in these directions, making them easy for a user to view and access. It will be understood, however, that other embodiments may include control displays having a different type, size, shape, and/or in a different location than that of the housing **210** depicted in Figures 2A-2C.

Referring now to Figure 2D, a bottom view of the housing **210** is depicted. The bottom portion **219** of the housing **210** includes one or more bases or feet **209**. The base or bases **209** are structured and positioned to support the housing **210** on a support surface. In some embodiments, the base or bases **209** are structured for proper placement on a mesh support surface such as a mezzanine floor or a display rack where the support surface includes spaced apart holes. In these instances, improper spacing or sizing of a base or bases on the housing **210** may cause one or more of the bases **209** to be located in a hole of the perforated or mesh support surface causing the housing **210** to not sit level on the support surface.

To address this issue, as depicted in Figure 2D, in some embodiments, the housing **210** may include one or a plurality of bases **209** that are sized so as to have a dimension that is larger than a dimension of the holes in the support surface, such that the bases contact the edges of the holes in the support surface on which each base rests. Note, that many perforated or mesh support surfaces may have holes with multiple dimensions. For example, if the holes are square-shaped, the diagonal dimension of the hole will be larger than the side dimensions of the hole. As such, in

some embodiments, the bases **209** are sized to be larger than the largest dimension of the holes of a given support surface to prevent the bases from inserting into the holes and making the housing unlevel. This allows the housing **210** to be placed in various orientations on the support surface while maintaining the housing **210** at a level orientation relative to the support surface.As also depicted in Figure 2D, in one embodiment, the housing **210** may include one or more bases **209** that are of a non-square or non-circular shape, such as oval in shape. This also allows the housing to be placed into different orientations on the mesh support surface in a level position, as the bases **209** are shaped and sized to span a dimension of the holes so as to rest on the edges of the holes in the support surface.

As also depicted in Figure 2D, in one embodiment, the housing **210** may include one or more bases **209** that are spaced apart in a non-square or non-rectangular configuration. For example, as demonstrated by the dotted line the bases may be spaced in a trapezoidal configuration. Other configurations such as triangular, rhombus, etc. are contemplated.

As also depicted in Figure 2D, in one embodiment, the housing **210** may include one or more bases **209** that include a first end **209A** for connection to the housing bottom portion **219** and a second opposed end **209B** for contacting the support surface. The first and second opposed ends are spaced apart by one or more sidewalls **209C**. The first end **209A** has a larger lateral dimension than the second opposed end **209B**, and the sidewalls **209C** are tapered or drafted from the first end **209A** to the second end **209B**. In this manner, the first end **209A** of each base can be placed further apart on the bottom portion **219** of the housing **210** and taper so as to create a smaller "foot print" for contacting the support surface.

An example of a mesh support surface might include strands (e.g., of steel or other material capable of reliably supporting the weight of an air treatment device) that are arranged in a grid pattern to provide substantially rectangular holes, The rectangular holes might be dimensioned, for example, approximately 0.8 inch to approximately one inch wide by approximately 3 ¾ inches long. The footprints of the ends 209B can be dimensioned so that, regardless of how the device is oriented in an upright position on the grid, the device remains level and the bases will not tend to fall into one of the holes in the grid.

As illustrated in Figures 2B and 2C, the housing **210** includes a handle **208** for lifting and carrying the unit. In some embodiments, the handle **208** is positioned vertically, horizontally, or both vertically and horizontally relative to the distribution of weight of the materials and components on and inside each device, so that when each device is lifted by its handle **208** the device has very little, or no, tendency to pivot about the handle. This tends to keep each device substantially upright when being lifted and can make movement of the devices from one location to another much less clumsy and much less likely to result in tipping or bumping of the devices. Following the general concept that an object will balance when its center of gravity (i.e., the position where all of its mass, on the average, resides) is directly over or under the point of support, the weight of the unit is substantially balanced relative to the placement of the handle **208**.

Referring now to Figures 3A-3C, a housing **310** according to another embodiment of the present invention is illustrated. The housing **310** includes a front portion **311**, rear portion **316**, and a bottom portion **319**. The front portion **311** includes a first front curvature **313**, a second front curvature **304**, and an air inlet **323** including a recessed portion **312**. The recessed portion **312** includes one or more connectors **314** and upper, lower, and opposed side edges **315A-315D**. The rear portion **316** includes an air outlet **317**, a first rear curvature **305**, a second rear curvature **318**, a handle **308**, and a bottom portion **319** including one or more bases **309**. In addition, the housing **310** may also include a cowling **320** including a cowling curvature **322**, filters **330**, and a control display **340** including one or more control display buttons **342**. It will also be understood that, like the housing **110**, the housing **310** of this embodiment may also include a power cord for delivering power to the device, a power cord management system for storing a power cord associated with the device, and/or one or more fasteners for assembling the device..

As shown in Figure 3B, the first front curvature **313** extends from the first point **313A** positioned near a central region of the front portion **311** and continues upwardly and backwardly to the second point **313B** positioned near a top perimeter of the front portion **311**. As a source of reference only, Figure 3B also depicts a vertical reference plane **VRP**, which may be defined at an exemplary forward-most point **FMP** on the front portion **311**. In some embodiments, the first front curvature

313 curves away from the vertical reference plane **VRP** as the front portion **311** extends vertically upwards in a direction away from the bottom portion **319**. In other embodiments, the first front curvature **313** diverges away from the vertical reference plane **VRP** at a more pronounced or substantial rate than the rest of the front portion **311**. Further, in some embodiments, the first front curvature **313** curves around a substantially horizontal axis running through the housing **310**, such that the first front curvature **313** may be characterized as convex as viewed from the exterior of the housing **310**.

As shown in Figure 3C, in some embodiments, the first front curvature **313** may also extend laterally outwardly and backwardly. The first front curvature **313** may be substantially symmetrical about a plane of symmetry **POS** that runs through the middle of the housing **310** and that is substantially perpendicular to the vertical reference plane **VRP**. The first front curvature **313** of one embodiment curves backwardly so as to diverge further away from the vertical reference plane **VRP** as the front portion **311** extends laterally away from the plane of symmetry **POS**. The first front curvature **313** presents an aesthetically pleasing shape and tends to make the housing **310** appear less imposing or obtrusive than it would appear without the first front curvature **313**. The first front curvature **313** also provides a convenient-to-view and convenient-to-access location for at least a portion of the control display **340**.

Figure 3B also illustrates the first rear curvature **305** extending from a first point **305A** positioned near a rear perimeter of the rear portion **316** and continuing upwardly and forwardly to the second point **305B** near a top perimeter of the rear portion **316**. In one embodiment, the first rear curvature **305** curves around a substantially horizontal axis positioned outside of the housing **310**, such that the first rear curvature **305** may be characterized as concave as viewed from the exterior of the housing **310**. In another embodiment, the second point **313B** of the front portion **311** and the second point **305B** of the rear portion **316** may be positioned in the same location on the housing **310**. Also in another embodiment, the first rear curvature **305** may also extend outwardly and forwardly (or flare), such that the first rear curvature **305** is substantially symmetrical about the plane of symmetry **POS**

that runs through the middle of the housing **310** and that is substantially perpendicular to the bottom portion **319**.

As shown in Figure 3C, the second front curvature **304** extends from the first point **304A** positioned near a central region of front portion **311** and continues laterally outwardly and backwardly (away from the vertical reference plane **VRP**) to the second point **304B** positioned near an outer perimeter of the front portion **311**. In many embodiments, including the one shown in Figure 3C, the second front curvature **304** also extends from the first point **304A** laterally outwardly and backwardly in a direction substantially opposite from the second point **304B**, such that the second front curvature **304** is substantially symmetrical about the plane of symmetry **POS** that runs through the middle of the housing **310** and that is substantially perpendicular to the bottom portion **319**. In some embodiments, the second front curvature **304** curves around a substantially vertical axis positioned in the housing **310**, such that the second front curvature **304** may be characterized as convex as viewed from the exterior of the housing **310**. As shown in Figure 3B, the second front curvature **304** may also diverge or curve away from the vertical reference plane **VRP** as the front portion **311** extends vertically up in a direction away from the bottom portion **319**.

Also shown in Figure 3C is a second rear curvature **318**, which extends from the first point **318A** positioned near a rear perimeter of the rear portion **316** and continues forwardly and outwardly (or flares out) to the second point **318B** positioned near a front edge of the rear portion **316**. In some embodiments, including the one shown in Figure 3C, another curvature **318'** that substantially mirrors the second rear curvature **318** is positioned on a substantially opposite side of the housing **310**, such that the housing **310** is substantially symmetrical about the plane of symmetry **POS** that runs through the middle of the housing **310** and that is substantially perpendicular to the bottom portion **319**. In some embodiments, the second rear curvature **318** curves around a substantially vertical axis positioned outside of the housing **310**, such that the second rear curvature **318** may be characterized as concave as viewed from the exterior of the housing **310**. Likewise, in some embodiments, the curvature **318'** curves around a substantially vertical axis

positioned outside of the housing **310**, such that the curvature **318'** may be characterized as concave as viewed from the exterior of the housing **310**.

As with some of the other embodiments described herein, it will be understood that at least a portion of the first rear curvature **305** and at least a portion of the second rear curvature **318** are positioned between the air outlet **317** and the air inlet **323**. This helps deflect air from the air outlet **317** substantially away from the air inlet **323** and tends to prevent or inhibit air flowing out of the air outlet **317** from immediately reentering the air inlet **323** of the housing **310**. Further, it will be understood that, in some embodiments, the second rear curvature **318**, like the first front curvature **313**, the second front curvature **304**, and/or the first rear curvature **305**, may extend through one or more planes substantially parallel to the bottom portion **319**, through one or more planes substantially perpendicular to the bottom portion **319**, and/or through one or more planes in between. Accordingly, in some embodiments, including those shown in Figures 3A-3C, the first front curvature **313** may smoothly transition into the second curvature **304** and/or vice versa, and/or the second rear curvature **318** may smoothly transition into the first rear curvature **305** and/or vice versa.

As shown in Figures 3A-3C, the housing **310** may have a cowling **320** including a cowling curvature **322**. In some embodiments, when the cowling is releasably connected to the housing **310**, the cowling curvature **322** curves around a substantially vertical axis positioned in the housing **310**, such that the cowling curvature **322** may be characterized as convex as viewed from the exterior of the housing **310**. In another embodiment, the cowling curvature **322** curves around a substantially horizontal axis positioned in the housing **310**, such that the cowling curvature **322** may be characterized as convex as viewed from the exterior of the housing **310**.

In some embodiments, the cowling curvature **322** may also be substantially symmetrical about the plane of symmetry **POS** that runs through the middle of the housing **310**. In still other embodiments, the cowling curvature **322** may also be substantially symmetrical about other planes that are substantially perpendicular to the bottom portion **319**, substantially parallel to the bottom portion **319**, and/or about one or more planes in between. Further, as shown in Figures 3A-3C, the shape of the

cowling curvature **322** may conform to the first front curvature **313** and/or the second front curvature **304**, such that the cowling curvature **322** would smoothly transition into the first front curvature **313** and/or the second front curvature **304** if the opening to the air inlet **323** did not exist in the front portion **311** between the edges **315A-315D** and the cowling **320**. The cowling curvature **322** complements the other curvatures **313**, **304**, **305**, and **318** to achieve a functional housing shape that also is aesthetically pleasing, helps the air treatment device **300** appear more graceful and sleek, and provides the air treatment device **300** with a slim and less obtrusive appearance from front to back and/or from side to side.

The control display **340** may include an outer curvature that substantially conforms to the shape of the first front curvature **313**, thereby allowing the display **340** to be viewed from a position in front of and level with the display **340** and at a position in front of and above the display **340**. In this configuration, at least some of the information and control buttons **342** on the control display **340** are also projected in these directions, making them easy for a user to view and access. It will be understood, however, that other embodiments may include control displays having a different type, size, shape, and/or in a different location than that of the housing **310** depicted in Figures 3A-3C.

As illustrated in Figures 3B and 3C, the housing **310** includes a handle **308** for lifting and carrying the unit. In some embodiments, the handle **308** is positioned vertically, horizontally, or both vertically and horizontally relative to the center of gravity of the unit so that when the unit is lifted, the unit does not swing or rotate significantly either front and rearwardly or side to side. Following the general concept that an object will balance when its center of gravity (i.e., the position where all of its mass, on the average, resides) is directly over or under the point of support, the weight of the unit is substantially balanced relative to the placement of the handle **308**.

Referring now to Figures 4A-4D, a housing **410** according to another embodiment of the present invention is illustrated. The housing **410** includes a front portion **411**, rear portion **416**, and the bottom portion **419**. The front portion **411** includes a first front curvature **413**, second front curvature **404**, and an air inlet **423** including a recessed portion **412**. The recessed portion **412** includes one or more

connectors **414** and upper, lower, and opposed side edges **415A-415D**. The rear portion **416** includes an air outlet **417**, a first rear curvature **405**, a second rear curvature **418**, a handle **408**, a remote control holder **403**, and a bottom portion **419** that includes one or more bases **409**. Though not shown, the housing **410** may also include one or more purification systems in some embodiments. In addition, the housing **410** may also include a cowling **420** including a cowling curvature **422**, and a control display **440** including one or more control display buttons **442**. It will also be understood that, like the housing **110**, the housing **410** of this embodiment may also include a power cord for delivering power to the device, a power cord management system for storing a power cord associated with the device, and/or one or more fasteners for assembling the device.

As shown in Figure 4B, the first front curvature **413** extends from the first point **413A** positioned near a central region of the front portion **411** and continues upwardly and backwardly to the second point **413B** positioned near a top perimeter of the front portion **411**. As a source of reference only, Figure 4B also depicts a vertical reference plane **VRP**, which may be defined at an exemplary forward-most point **FMP** on the front portion **411**. In some embodiments, the first front curvature **413** curves away from the vertical reference plane **VRP** as the front portion **411** extends vertically upwards in a direction away from the bottom portion **419**. In other embodiments, the first front curvature **413** diverges away from the vertical reference plane **VRP** at a more pronounced or substantial rate than the rest of the front portion **411**. Further, in some embodiments, the first front curvature **413** curves around a substantially horizontal axis running through the housing **410**, such that the first front curvature **413** may be characterized as convex as viewed from the exterior of the housing **410**.

As shown in Figure 4C, in some embodiments, the first front curvature **413** may also extend laterally outwardly and backwardly. The first front curvature **413** may be substantially symmetrical about a plane of symmetry **POS** that runs through the middle of the housing **410** and that is substantially perpendicular to the vertical reference plane **VRP**. The first front curvature **413** of one embodiment curves backwardly so as to diverge further away from the vertical reference plane **VRP** as the front portion **411** extends laterally away from the plane of symmetry **POS**. The

first front curvature **413** presents an aesthetically pleasing shape and tends to make the housing **410** appear less imposing or obtrusive than it would appear without the first front curvature **413**. The first front curvature **413** also provides a convenient-to-view and convenient-to-access location for at least a portion of the control display **440**.

Figure 4B also illustrates the first rear curvature **405** extending from a first point **405A** positioned near a rear perimeter of the rear portion **416** and continuing upwardly and forwardly to the second point **405B** near a top perimeter of the rear portion **416**. In one embodiment, the first rear curvature **405** curves around a substantially horizontal axis positioned outside of the housing **410**, such that the first rear curvature **405** may be characterized as concave as viewed from the exterior of the housing **410**. In another embodiment, the second point **413B** of the front portion **411** and the second point **405B** of the rear portion **416** may be positioned in the same location on the housing **410**. Also in another embodiment, the first rear curvature **405** may also extend outwardly and forwardly (or flare), such that the first rear curvature **405** is substantially symmetrical about the plane of symmetry **POS** that runs through the middle of the housing **410** and that is substantially perpendicular to the bottom portion **419**.

As shown in Figure 4C, the second front curvature **404** extends from the first point **404A** positioned near a central region of front portion **411** and continues laterally outwardly and backwardly (away from the vertical reference plane **VRP**) to the second point **404B** positioned near an outer perimeter of the front portion **411**. In many embodiments, including the one shown in Figure 4C, the second front curvature **404** also extends from the first point **404A** laterally outwardly and backwardly in a direction substantially opposite from the second point **404B**, such that the second front curvature **404** is substantially symmetrical about the plane of symmetry **POS** that runs through the middle of the housing **410** and that is substantially perpendicular to the bottom portion **419**. In some embodiments, the second front curvature **404** curves around a substantially vertical axis positioned in the housing **410**, such that the second front curvature **404** may be characterized as convex as viewed from the exterior of the housing **410**. As shown in Figure 4B, the second front curvature **404** may also diverge or curve away from the vertical

reference plane **VRP** as the front portion **411** extends vertically up in a direction away from the bottom portion **419**.

Also shown in Figure 4C is a second rear curvature **418**, which extends from the first point **418A** positioned near a rear perimeter of the rear portion **416** and continues forwardly and outwardly (or flares out) to the second point **418B** positioned near a front edge of the rear portion **416**. In some embodiments, including the one shown in Figure 4C, another curvature **418'** that substantially mirrors the second rear curvature **418** is positioned on a substantially opposite side of the housing **410**, such that the housing **410** is substantially symmetrical about the plane of symmetry **POS** that runs through the middle of the housing **410** and that is substantially perpendicular to the bottom portion **419**. In some embodiments, the second rear curvature **418** curves around a substantially vertical axis positioned outside of the housing **410**, such that the second rear curvature **418** may be characterized as concave as viewed from the exterior of the housing **410**. Likewise, in some embodiments, the curvature **418'** curves around a substantially vertical axis positioned outside of the housing **410**, such that the curvature **418'** may be characterized as concave as viewed from the exterior of the housing **410**.

As with some of the other embodiments described herein, it will be understood that at least a portion of the first rear curvature **405** and at least a portion of the second rear curvature **418** are positioned between the air outlet **417** and the air inlet **423**. This helps deflect air from the air outlet **417** substantially away from the air inlet **423** and tends to prevent or inhibit air flowing out of the air outlet **417** from immediately reentering the air inlet **423** of the housing **410**. Further, it will be understood that, in some embodiments, the second rear curvature **418**, like the first front curvature **413**, the second front curvature **404**, and/or the first rear curvature **405**, may extend through one or more planes substantially parallel to the bottom portion **419**, through one or more planes substantially perpendicular to the bottom portion **419**, and/or through one or more planes in between. Accordingly, in some embodiments, including those shown in Figures 4A-4C, the first front curvature **413** may smoothly transition into the second front curvature **404** and/or vice versa, and/or the second rear curvature **418** may smoothly transition into the first rear curvature **405** and/or vice versa.

As shown in Figures 4A-4C, the housing **410** may have a cowling **420** including a cowling curvature **422**. In some embodiments, when the cowling is releasably connected to the housing **410**, the cowling curvature **422** curves around a substantially vertical axis positioned in the housing **410**, such that the cowling curvature **422** may be characterized as convex as viewed from the exterior of the housing **410**. In another embodiment, the cowling curvature **422** curves around a substantially horizontal axis positioned in the housing **410**, such that the cowling curvature **422** may be characterized as convex as viewed from the exterior of the housing **410**.

In some embodiments, the cowling curvature **422** may also be substantially symmetrical about the plane of symmetry **POS** that runs through the middle of the housing **410**. In still other embodiments, the cowling curvature **422** may also be substantially symmetrical about other planes that are substantially perpendicular to the bottom portion **419**, substantially parallel to the bottom portion **419**, and/or about one or more planes in between. Further, as shown in Figures 4A-4C, the shape of the cowling curvature **422** may conform to the first front curvature **413** and/or the second front curvature **404**, such that the cowling curvature **422** would smoothly transition into the second front curvature **404** if the substantially U-shaped opening to the air inlet **423** did not exist in the front portion **411** between the edges **415B-415D** and the cowling **420**. The cowling curvature **422** complements the other curvatures **413**, **404**, **405**, and **418** to achieve a functional housing shape that also is aesthetically pleasing, helps the air treatment device **400** appear more graceful and sleek, and provides the air treatment device **400** with a slim and less obtrusive appearance from front to back and/or from side to side.

The control display **440** may include an outer curvature that substantially conforms to the shape of the first front curvature **413**, thereby allowing the display **440** to be viewed from a position in front of and level with the display **440** and at a position in front of and above the display **440**. In this configuration, at least some of the information and control buttons **442** on the control display **440** are also projected in these directions, making them easy for a user to view and access. It will be understood, however, that other embodiments may include control displays having a

different type, size, shape, and/or in a different location than that of the housing **410** depicted in Figures 4A-4C.

In addition, Figures 4C and 4D illustrate a remote control holder **403** positioned below the handle **408** on the rear portion **416** of the housing **410**, although in other embodiments, the remote control holder **403** may be positioned anywhere on the housing **410**. As shown, the remote control holder **403** is a cavity in the rear portion **416** having a size and shape configured to hold at least one remote control (not shown) for remotely operating at least one function and/or aspect of the air treatment device **400**. However, it will be understood that other embodiments of the present invention may include different sizes, shapes, and/or types of remote control holders, including, for example, a fastener, clip, slot, magnet, hook, and/or anything else that may be configured to hold and/or releasably secure a remote control at least partially within, to, and/or adjacent to the housing.

In addition to the other features mentioned herein, the air treatment device **400** also includes one or more sensors positioned, for example, in the control display **440**, for communicating with the remote control. In some embodiments, the remote control communicates with the sensors on the air treatment device **400** via one or more infrared (IR) signals, but other mediums of wireless communication may be used instead, such as, for example, one or more optical and/or radio signals. In addition to the air treatment device **400**, it will be understood that the other embodiments described herein, including air treatment devices **100**, **200**, **300**, and **500**, may also include one or more remote control holders and/or one or more sensors for communicating with one or more remote controls.

Further, as shown in Figures 4A-4C, the cowling **420** is positioned relative to the recessed portion **412**, such that together the cowling **420** and the edges **415B-415D** of the recessed portion **412** define a substantially U-shaped opening to the air inlet **423** for air to enter the housing **410**. The shape of this opening to the air inlet **423** is different from some of the other embodiments described herein because a top portion of the cowling **420** smoothly transitions into the front portion **411** to provide little, if any, distance between the top edge **415A** and the cowling **420**. However, it will be understood that, in other embodiments, a substantially U-shaped opening to

the air inlet **423** could alternatively be created by abutting the cowling **420** with one of the bottom or side edges **415B-415D** of the recessed portion **412**.

In some embodiments, including the one shown in Figures 4A-4C, the cowling curvature **422** smoothly transitions into the first front curvature **413**. Also, in some embodiments and shown in Figures 4A-4C, the recessed portion **412** extends past a top portion of the cowling **420** and continues towards a top perimeter of the front portion **411**. Additionally, the recessed portion **412** may conform to the first front curvature **413** and/or may transition or converge into the front portion **411** near a top perimeter of the front portion **411**, as shown in Figures 4A-4C.

Referring again to Figure 4D, the housing **410** also includes a power cord **406A** and a power cord management system **406**, in accordance with an embodiment of the present invention. As shown, the power cord management system **406** includes a recessed portion **406B** located in the housing **410**. The recessed portion **406B** further includes a first knob **406C** and a second knob **406D**. As shown, the first knob **406C** and the second knob **406D** are positioned within the recessed portion **406B**, are spaced apart from one another along an axis that is substantially parallel to the bottom portion **419**, and extend outwardly from the recessed portion in a direction substantially parallel to the plane of symmetry **POS**.

According to one embodiment, the power cord **406A** is operable to transfer power from a power source (not shown) to one or more portions of the air treatment device **400**. In addition, the recessed portion **406B**, first knob **406C**, and second knob **406D** are operable to at least partially secure, contain, support, and/or store at least a portion of the power cord **406A** within at least a portion of the recessed portion **406B**. In operation, according to one embodiment, the power cord management system **406** is structured so that a user may wrap and/or otherwise position the power cord **406A** on and/or around one or both of the first knob **406C** and/or the second knob **406D**, such that at least a portion of the power cord **406A** is at least partially stored within the recessed portion **406B**. In some embodiments, the knobs may each include protuberances at distal ends thereof to better secure the power cord **406A** around the knobs and within the recessed portion **406B**. Like the embodiments of the power cord management system **106** discussed in connection with Figures 1B, 1E, and 1F, the power cord management system **406** aids in

protecting the power cord **406A** from damage when the unit is not in use. The power cord management system **406** also complements the shape of the air treatment device **400** so as affectively maintain the power cord without substantially visually impacting the aesthetic design of the air treatmem device **400**.

Further, it will be understood that the recessed portion **406B** may include any shape, any size, and/or may be positioned anywhere on and/or in the housing **410**. For example, as shown in Figure 4D, the recessed portion **406B** is positioned near a lower portion of the rear portion **416**. In addition, the recessed portion **406B** includes a bottom portion having a substantially rectangular shape and an upper portion having a substantially parabolic shape that extends upwardly and laterally outwardly. Further, as shown in Figure 4D, the recessed portion **406B** may extend in a direction substantially parallel to the vertical reference plane **VRP** and/or in a direction substantially perpendicular to the plane of symmetry **POS**. Still further, it will be understood that, in some embodiments, one or more portions of the recessed portion **406B** may substantially conform to one or more of the curvatures of the housing **410**, including, for example, the first front curvature **413**, the second front curvature **404**, the first rear curvature **405**, and/or the second rear curvature **418**. Also as shown, the recessed portion **406B** may be integral with, and/or formed from the same materials as, the rear portion **416**. It will also be understood that the recessed portion **406B** may be recessed into the housing **410** by any depth, and in one embodiment, the recessed portion **406B** is recessed into the rear portion **416** at a depth suitable to store all or nearly all of the power cord **406A** entirely within the recessed portion **406B**.

However, it will be understood that the recessed portion **406B** may include different dimensions in other embodiments, including, for example, having a substantially square shape, an orientation substantially perpendicular to the vertical reference plane **VRP**, a depth unsuitable for storing the power cord **406A** entirely within the recessed portion **406B**, and/or the like. In other embodiments, the recessed portion **406B** may be at least partially defined by, located on and/or in, and/or positioned on and/or in some other portion of the housing **410** in addition to, or instead of, the rear portion **416**. Still further, in some embodiments, the recessed portion **406B** may be distinct from the rear portion **416** and/or be formed from one or

more materials other than, or in addition to, those used to form the rear portion **416** and/or other portions of the housing **410**. Also, in other embodiments, the recessed portion **406B** may include more or fewer knobs, include knobs that are positioned in the recessed portion **406B** in a different configuration, and/or include knobs of different shapes and/or sizes. Additionally, in some embodiments, the recessed portion **406B** may include hooks, handles, and/or some other structure on and/or around which to position the power cord **406A** in addition to, or instead of, one or more knobs.

As illustrated in Figures 4C and 4D, the housing **410** includes a handle **408** for lifting and carrying the unit. In some embodiments, the handle **408** is positioned vertically, horizontally, or both vertically and horizontally relative to the center of gravity of the unit so that when the unit is lifted, the unit does not swing or rotate significantly either front and rearwardly or side to side. Following the general concept that an object will balance when its center of gravity (i.e., the position where all of its mass, on the average, resides) is directly over or under the point of support, the weight of the unit is substantially balanced relative to the placement of the handle **408**.

Referring now to Figures 5A-5C, an embodiment of a housing **510** according to one embodiment of the present invention is illustrated. The housing **510** has a front portion **511**, rear portion **516**, and a bottom portion **519**. The front portion **511** includes a first front curvature **513**, second front curvature **504**, and an air inlet **523** including a recessed portion **512**. The recessed portion **512** includes one or more connectors **514** and upper, lower, and opposed side edges **515A-515D**. The rear portion **516** includes an air outlet **517**, a first rear curvature **505**, a second rear curvature **518** including first and second curvature regions **518E-518F**, a handle **508**, a remote control holder **503**, and a bottom portion **519** including one or more bases **509**. Though not shown, the housing **510** may also include one or more purification systems in some embodiments. In addition, the housing **510** may also include a cowling **520** including a cowling curvature **522**, and a control display **540** including one or more control display buttons **542**. It will also be understood that, like the housing **110**, the housing **510** of this embodiment may also include a power cord for delivering power to the device, a power cord management system for storing a power

cord associated with the device, and/or one or more fasteners for assembling the device.

As shown in Figure 5B, the first front curvature **513** extends from the first point **513A** positioned near a central region of the front portion **511** and continues upwardly and backwardly to the second point **513B** positioned near a top perimeter of the front portion **511**. As a source of reference only, Figure 5B also depicts a vertical reference plane **VRP**, which may be defined at an exemplary forward-most point **FMP** on the front portion **511**. In some embodiments, the first front curvature **513** curves away from the vertical reference plane **VRP** as the front portion **511** extends vertically upwards in a direction away from the bottom portion **519**. In other embodiments, the first front curvature **513** diverges away from the vertical reference plane **VRP** at a more pronounced or substantial rate than the rest of the front portion **511**. In some embodiments, the first front curvature **513** curves around a substantially horizontal axis running through the housing **510**, such that the first front curvature **513** may be characterized as convex as viewed from the exterior of the housing **510**.

As shown in Figure 5C, in some embodiments, the first front curvature **513** may also extend laterally outwardly and backwardly. The first front curvature **513** may be substantially symmetrical about a plane of symmetry **POS** that runs through the middle of the housing **510** and that is substantially perpendicular to the vertical reference plane **VRP**. The first front curvature **513** of one embodiment curves backwardly so as to diverge further away from the vertical reference plane **VRP** as the front portion **511** extends laterally away from the plane of symmetry **POS**. The first front curvature **513** presents an aesthetically pleasing shape and tends to make the housing **510** appear less imposing or obtrusive than it would appear without the first front curvature **513**. The first front curvature **513** also provides a convenient-to-view and convenient-to-access location for at least a portion of the control display **540**.

Figure 5B also illustrates the first rear curvature **505** extending from a first point **505A** positioned near a rear perimeter of the rear portion **516** and continuing upwardly and forwardly to the second point **505B** near a top perimeter of the rear portion **516**. In one embodiment, the first rear curvature **505** curves around a

substantially horizontal axis positioned outside of the housing **510**, such that the first rear curvature **505** may be characterized as concave as viewed from the exterior of the housing **510**. In another embodiment, the second point **513B** of the front portion **511** and the second point **505B** of the rear portion **516** may be positioned in the same location on the housing **510**. Also in another embodiment, the first rear curvature **505** may also extend outwardly and forwardly (or flare), such that the first rear curvature **505** is substantially symmetrical about the plane of symmetry **POS** that runs through the middle of the housing **510** and that is substantially perpendicular to the bottom portion **519**.

As shown in Figure 5C, the second front curvature **504** extends from the first point **504A** positioned near a central region of front portion **511** and continues laterally outwardly and backwardly (away from the vertical reference plane **VRP**) to the second point **504B** positioned near an outer perimeter of the front portion **511**. In many embodiments, including the one shown in Figure 5C, the second front curvature **504** also extends from the first point **504A** laterally outwardly and backwardly in a direction substantially opposite from the second point **504B**, such that the second front curvature **504** is substantially symmetrical about the plane of symmetry **POS** that runs through the middle of the housing **510** and that is substantially perpendicular to the bottom portion **519**. In some embodiments, the second front curvature **504** curves around a substantially vertical axis positioned in the housing **510**, such that the second front curvature **504** may be characterized as convex as viewed from the exterior of the housing **510**. As shown in Figure 5B, the second front curvature **504** may also diverge or curve away from the vertical reference plane **VRP** as the front portion **511** extends vertically up in a direction away from the bottom portion **519**.

Also shown in Figure 5C is the second rear curvature **518**, which is positioned on the rear portion **516** and, when viewed from above the housing **510**, substantially resembles a portion of a bell-shaped curve. In this embodiment, the second rear curvature **518** extends (or flares) laterally outwardly as it extends towards the front portion **511**. In this particular embodiment, the second rear curvature **518** includes two curvature regions **518E** and **518F**, but in other embodiments, the second rear curvature **518** may include more or fewer curvature

regions. As shown, these two curvature regions **518E** and **518F** may be arranged on one side of the plane of symmetry **POS**.

In some embodiments, as shown, another curvature **518'** that mirrors each region **518E** and **518F** may be arranged on the opposite side of the plane of symmetry **POS** on the housing **510**. Together, the curvatures **518** and **518'** define exterior side walls of the rear portion **516**, and in some embodiments, such as the one shown, the curvatures **518** and **518'** may extend rearward from the front portion **511** and converge near a rear perimeter of the rear portion **516**. Further, as shown in Figure 5C, the curvatures **518** and **518'** substantially resemble a portion of a bell-shaped curve when viewed from above the housing **510**.

The first curvature region **518E** of the second rear curvature **518** extends from a first point **518A** positioned at or near, depending on the embodiment, a junction of the front portion **511** and rear portion **516** and continues rearward to a second point **518B** positioned on the perimeter of rear portion **516**. In some embodiments, the first curvature region **518E** curves around a substantially vertical axis positioned outside of the housing **510**, such that the first curvature region **518E** may be characterized as concave as viewed from the exterior of the housing **510**. The second curvature region **518F** of the second rear curvature **518** extends from a third point **518C** on the perimeter of the rear portion **516** and continues rearward to a fourth point **518D** positioned near a further most rear point on the rear portion **516**. In some embodiments, the second curvature region **518F** curves around a substantially vertical axis positioned inside of the housing **510**, such that the second curvature region **518F** may be characterized as convex as viewed from the exterior of the housing **510**.

In some embodiments, the second point **518B** and the third point **518C** may be positioned at the same location on the perimeter of the rear portion **516**. Further, as illustrated in Figure 5B, the first point **518A** may be located at the junction of the front and rear portions **511**, **516** or there may be a fillet portion **518G** between the first point **518A** and the front portion **511**.

As with some of the other embodiments described herein, it will be understood that at least a portion of the first rear curvature **505** and at least a portion of the second rear curvature **518** are positioned between the air outlet **517** and the air

inlet **523**. This helps deflect air from the air outlet **517** substantially away from the air inlet **523** and tends to prevent or inhibit air flowing out of the air outlet **517** from immediately reentering the air inlet **523** of the housing **510**. For example, in some embodiments, such as that depicted in Figures 5A-5C, the air outlet **517** is located on the second curvature region **518F** defined between points **518C, 518D** of the second rear curvature **518**. Additionally, the first curvature region **518E** of the second rear curvature **518** is located between the air outlet **517** and the air inlet **523** on the front portion **511**. Accordingly, either the curvature of the front curvature region **518E**, the curvature of the second curvature region **518F**, or a combination of the two curvature regions **518E, 518F** inhibit air escaping the air outlet **517** from immediately reentering the housing **510** through the air inlet **523**.

In some embodiments, including the one shown in Figures 5A-5C, the first and second curvature regions **518E, 518F** of the second rear curvature **518** are positioned on a first side of the rear portion **516** of the housing **510**. In other embodiments, the opposed second side of the rear portion **516** has another curvature **518'** that substantially mirrors the second rear curvature **518**, thereby creating a rear portion **516** having a substantially bell-shaped curvature (when viewed from above) that is substantially symmetrical about the plane of symmetry **POS** that runs through the middle of the housing **510** and that is substantially perpendicular to the bottom portion **519**.

Further, it will be understood that, in some embodiments, the second rear curvature **518**, like the first front curvature **513**, second front curvature **504**, and/or first rear curvature **505**, may extend through one or more planes substantially parallel to the bottom portion **519**, through one or more planes substantially perpendicular to the bottom portion **519**, and/or through one or more planes in between. Accordingly, in some embodiments, including those shown in Figures 5A-5C, the first front curvature **513** may smoothly transition into the second front curvature **504** and/or vice versa, and/or the second rear curvature **518** may smoothly transition into the first rear curvature **505** and/or vice versa.

As shown in Figures 5A-5C, the housing **510** may have a cowling **520** including a cowling curvature **522**. In some embodiments, when the cowling is releasably connected to the housing **510**, the cowling curvature **522** curves around a

substantially vertical axis positioned in the housing **510**, such that the cowling curvature **522** may be characterized as convex as viewed from the exterior of the housing **510**. In another embodiment, the cowling curvature **522** curves around a substantially horizontal axis positioned in the housing **510**, such that the cowling curvature **522** may be characterized as convex as viewed from the exterior of the housing **510**.

In some embodiments, the cowling curvature **522** may also be substantially symmetrical about the plane of symmetry **POS** that runs through the middle of the housing **510**. In still other embodiments, the cowling curvature **522** may also be substantially symmetrical about other planes that are substantially perpendicular to the bottom portion **519**, substantially parallel to the bottom portion **519**, and/or about one or more planes in between. Further, as shown in Figures 5A-5C, the shape of the cowling curvature **522** may conform to the first front curvature **513** and/or the second front curvature **504**, such that the cowling curvature **522** would smoothly transition into the second front curvature **504** if the substantially U-shaped opening to the air inlet **523** did not exist in the front portion **511** between the edges **515B-515D** and the cowling **520**. The cowling curvature **522** complements the other curvatures **513**, **504**, **505**, and **518** to achieve a functional housing shape that also is aesthetically pleasing, helps the air treatment device **500** appear more graceful and sleek, and provides the air treatment device **500** with a slim and less obtrusive appearance from front to back and/or from side to side.

The control display **540** may include an outer curvature that substantially conforms to the shape of the first front curvature **513**, thereby allowing the display **540** to be viewed from a position in front of and level with the display **540** and at a position in front of and above the display **540**. In this configuration, at least some of the information and control buttons **542** on the control display **540** are also projected in these directions, making them easy for a user to view and access. It will be understood, however, that other embodiments may include control displays having a different type, size, shape, and/or in a different location than that of the housing **510** depicted in Figures 5A-5C.

In addition, similar to the housing **410** of Figures 4A-4C, the housing **510** may include a remote control holder **503** positioned below the handle **508** on the rear

portion **516** of the housing **510**, although it will be understood that other embodiments may include a remote control holder of a different size, shape, and/or positioned in a different location on the housing **510**.

Also similar to the embodiment of Figures 4A-4C, the air treatment device **500** includes one or more sensors positioned, for example, in the control display **540**, for communicating with a remote control (not shown). In some embodiments, the remote control communicates with the sensors on the air treatment device **500** via one or more infrared (IR) signals, but other mediums of wireless communication may be used instead, such as, for example, one or more optical and/or radio signals. In addition to the air treatment device **500**, it will be understood that the other embodiments described herein may also include one or more remote control holders and/or one or more sensors for communicating with one or more remote controls.

Further, as shown in Figures 5A-5C, the cowling **520** is positioned relative to the recessed portion **512**, such that together the cowling **520** and the edges **515B-515D** of the recessed portion **512** define a substantially U-shaped opening to the air inlet **523** for air to enter the housing **510**. The shape of this opening to the air inlet **523** is different from some of the other embodiments described herein because a top portion of the cowling **520** smoothly transitions into the front portion **511** to provide little, if any, distance between the top edge **515A** and the cowling **520**. However, it will be understood that, in other embodiments, a substantially U-shaped opening to the air inlet **523** could alternatively be created by abutting the cowling **520** with one of the bottom or side edges **515B-515D** of the recessed portion **512**.

In some embodiments, including the one shown in Figures 5A-5C, the cowling curvature **522** smoothly transitions into the first front curvature **513**. Also, in some embodiments and shown in Figures 5A-5C, the recessed portion **512** extends past a top portion of the cowling **520** and continues towards a top perimeter of the front portion **511**. Additionally, the recessed portion **512** may conform to the first front curvature **513** and/or may transition or converge into the front portion **511** near a top perimeter of the front portion **511**, as shown in Figures 5A-5C.

As illustrated in Figures 5B and 5C, the housing **510** includes a handle **508** for lifting and carrying the unit. In some embodiments, the handle **508** is positioned

vertically, horizontally, or both vertically and horizontally relative to the center of gravity of the unit so that when the unit is lifted, the unit does not swing or rotate significantly either front and rearwardly or side to side. Following the general concept that an object will balance when its center of gravity (i.e., the position where all of its mass, on the average, resides) is directly over or under the point of support, the weight of the unit is substantially balanced relative to the placement of the handle **508**.

It will be understood that the recessed portions **112, 212, 312, 412** and **512** may be provided with a curved or rounded wall configuration (or alternatively an internal corner) to serve, for example, as an air scoop for intake air. The curving of the recessed portions **112, 212, 312, 412** and **512** may be provided as a quarter turn (or approximately quarter-turn) so that air flowing into the air treatment devices **100, 200, 300, 400, 500** is directed inwardly towards the back (or interior) surface of the cowlings **120, 220, 320, 420** or **520**. This exemplary arrangement allows the air treatment devices **100, 200, 300, 400, 500** to be equipped with large openings to the air inlets **123, 223, 323, 423** or **523** without sacrificing the aesthetically pleasing and sleek appearance of the devices **100, 200, 300, 400, 500**. Notably, the exemplary arrangements, despite being provided with the relatively large openings to the air inlets **123, 223, 323, 423** or **523**, conceal the internal components or at least make them less conspicuous than might be the case with alternative arrangements (e.g., large forward-facing openings, louvers, inlet slits, grills, or the like) that lack such a turn or curving of the recessed portion **112, 212, 312, 412** or **512**. By enabling removal of the cowling **120, 220, 320, 420** or **520**, the illustrated embodiments may be provided in an easy-to-clean (as indicated above) configuration without compromising the aesthetically pleasing appearance of the device **100, 200, 300, 400, 500** and without sacrificing concealment of the internal components.

While certain exemplary embodiments have been described and shown in the accompanying drawings, it is to be understood that such embodiments are merely illustrative of, and not restrictive on, the broad invention, and that this invention not be limited to the specific constructions and arrangements shown and described, since various other changes, combinations, omissions, modifications and substitutions, in addition to those set forth in the above paragraphs, are possible. In view of this

2010200246 03 Jul 2012

disclosure, those skilled in the art will appreciate that various adaptations and modifications of the just described embodiments may be configured without departing from the scope and spirit of the invention. Therefore, it is to be understood that, within the scope of the appended claims, the invention may be practiced other than as specifically described herein.

Throughout this specification and the claims which follow, unless the context requires otherwise, the word "comprise", and variations such as "comprises" and "comprising", will be understood to imply the inclusion of a stated integer or step or group of integers or steps but not the exclusion of any other integer or step or group of integers or steps.

The reference to any prior art in this specification is not and should not be taken as an acknowledgement or any form of suggestion that the prior art forms part of the common general knowledge.

2010200246 03 Jul 2012

The claims defining the invention are as follows:

1. A housing for an air treatment device including:

a front portion;

a rear portion including first and second opposed exterior side surfaces respectively extending rearward from said front portion,

an air inlet located on said front portion; and

an air outlet located on said first exterior side surface of said rear portion, wherein said first exterior side surface of said rear portion includes a first curvature adjacent said front portion, wherein said first curvature is concave to thereby direct air flow from said air outlet away from said air inlet.

2. A housing according to claim 1, wherein said first exterior side surface of said rear portion includes a second curvature adjacent said first curvature, wherein said second curvature is convex.

3. A housing according to claim 2, wherein said air outlet is located on said second curvature of said first exterior side surface.

4. A housing according to any one of claims 1 to 3, wherein said second exterior side surface of said rear portion includes a third curvature adjacent said front portion, wherein said third curvature is concave.

5. A housing according to claim 4, wherein said second exterior side surface of said rear portion includes a fourth curvature that is convex and that is adjacent said third curvature.

6. A housing according to claim 3, wherein said second exterior side surface of said rear portion includes a third curvature adjacent said front portion, wherein said third curvature is concave and a fourth curvature that is convex and that is adjacent said third curvature.

7. A housing according to claim 6, wherein said second curvature of said first exterior side surface of said rear portion and said fourth curvature of said second exterior side surface of said rear portion are adjacent to each other such that said rear portion forms a bell-shaped curve.

8. A housing according to any one of claims 1 to 7, wherein said first curvature of said first exterior side surface of said rear portion is substantially

2010200246 03 Jul 2012

symmetrical about a plane that extends through a middle of the housing and that is substantially perpendicular to a bottom portion of the housing.

9. A housing according to any one of claims 1 to 8, further including a cowling releasably connected to said front portion of the housing, wherein said air inlet is configured to draw air around said cowling and into said air inlet.

10. A housing according to claim 9, wherein said cowling includes an exterior surface that is convex as viewed from an exterior of the housing.

11. A housing according to any one of claims 1 to 10, further including a cavity in one of said front portion or said rear portion configured for receipt of a remote control device.

12. A housing according to any one of claims 1 to 11, wherein said front portion includes an exterior surface, wherein at least a portion of said exterior surface has a convex curvature.

13. A housing according to claim 12, wherein said convex curvature exhibits a higher rate of curvature toward a top section of said front portion than a rate of curvature exhibited by a lower section of said front portion.

14. A housing according to any one of claims 1 to 13, wherein at least one of said front portion or said rear portion includes a slot for storing at least a portion of a power cord associated with the device.

15. A housing according to any one of claims 1 to 14, wherein said rear portion includes a slot extending from said first exterior side surface towards said second exterior side surface, said slot being structured to store at least a portion of a power cord associated with the device.

16. A housing according to any one of claims 1 to 15, wherein at least one of said front portion or said rear portion includes a knob for supporting at least a portion of a power cord associated with the device.

17. A housing according to any one of claims 1 to 16, wherein said rear portion includes a recessed portion, said recessed portion includes at least one knob structured to support at least a portion of a power cord associated with the device.

18. A housing for an air treatment device including:

a front portion;

a rear portion including first and second opposed exterior side surfaces respectively extending rearward from said front portion;

an air inlet located on said front portion; and

an air outlet located on said first exterior side surface of said rear portion, wherein said first and second exterior side surfaces of said rear portion include respective concave curves adjacent to said front portion and convex curves respectively adjacent the concave curves.

19. A housing according to claim 18, wherein said convex curves of said first and second exterior side surfaces of said rear portion are adjacent to each other such that said first and second exterior side surfaces of said rear portion form a substantially bell-shaped curve.

20. A housing according to either claim 18 or claim 19, further including a cowling releasably connected to said front portion of the housing, wherein said air inlet is configured to draw air around said cowling and into said air inlet.

21. A housing according to claim 20, wherein said cowling includes an exterior surface that is convex as viewed from an exterior of the housing.

22. A housing according to claims 18 to 21, further including a cavity in one of said front portion or said rear portion configured for receipt of a remote control device.

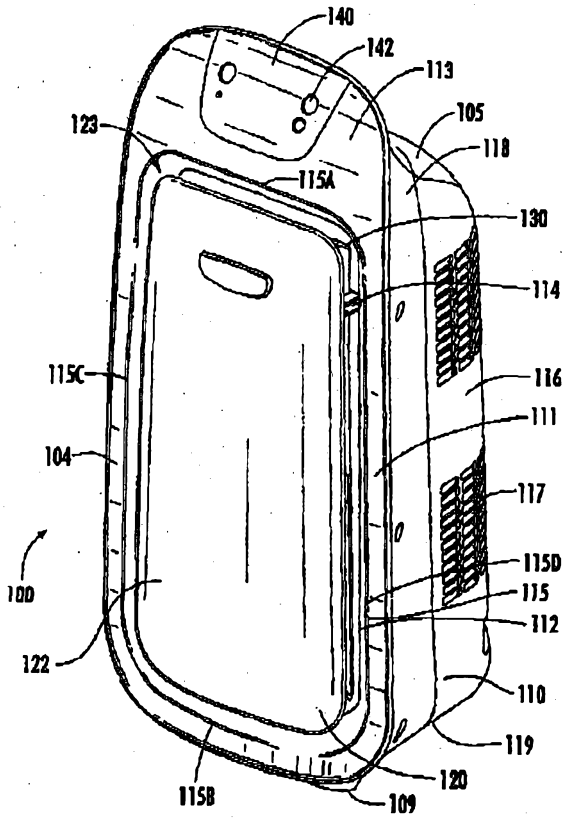
23. A housing according to any one of claims 18 to 22, wherein said front portion includes an exterior surface, wherein at least a portion of said exterior surface has a convex curvature.

24. A housing according to claim 23, wherein said convex curvature exhibits a higher rate of curvature toward a top of said front portion than a rate of curvature exhibited by a lower section of said front portion.

25. A housing according to any one of claims 18 to 24, wherein at least one of said front portion or said rear portion includes a slot for storing at least a portion of a power cord associated with the device.

26. A housing according to any one of claims 18 to 25, wherein at least one of said front portion or said rear portion includes a knob for supporting at least a portion of power cord associated with the device.

27. A housing according to either claim 1 or claim 18, substantially as herein before described with reference to the accompanying Figures.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142
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123
118
115A
130
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115C
116
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117
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115D
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122
110
119
120
115B
109

FIG. 1A

2010200246 22 Jan 2010

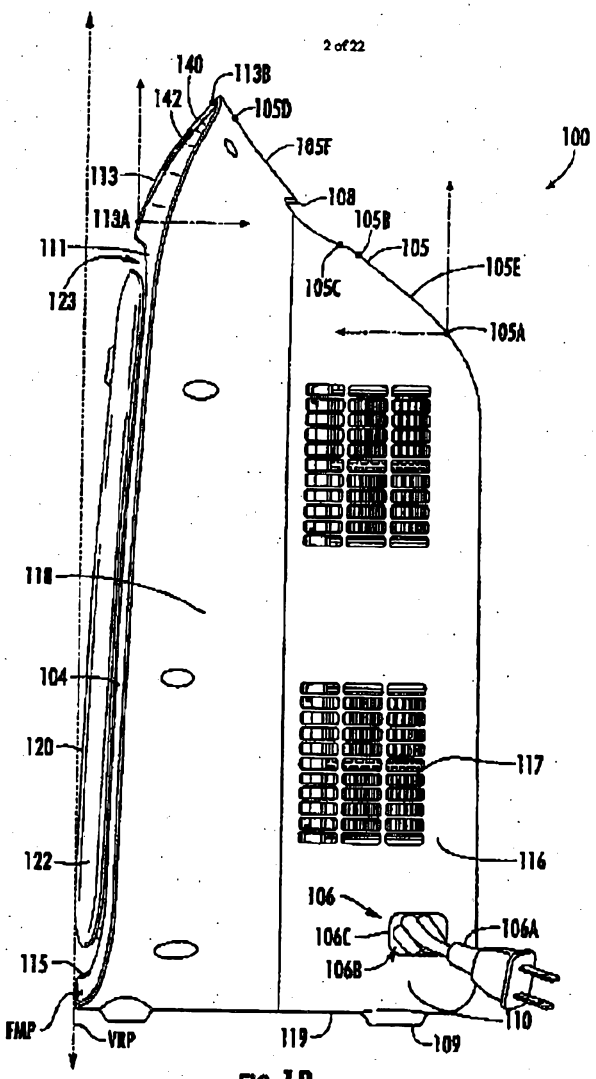


FIG. 1B

2010200246 22 Jan 2010

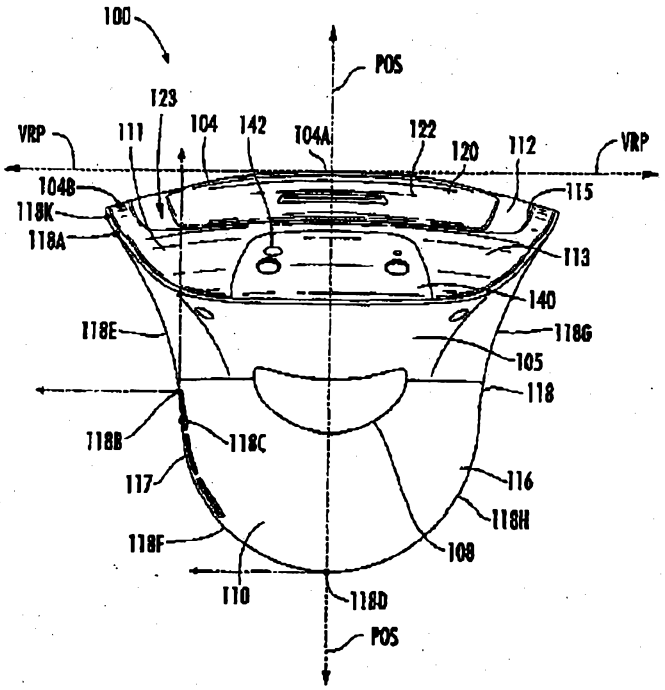


FIG. 1C

2010200246 22 Jan 2010

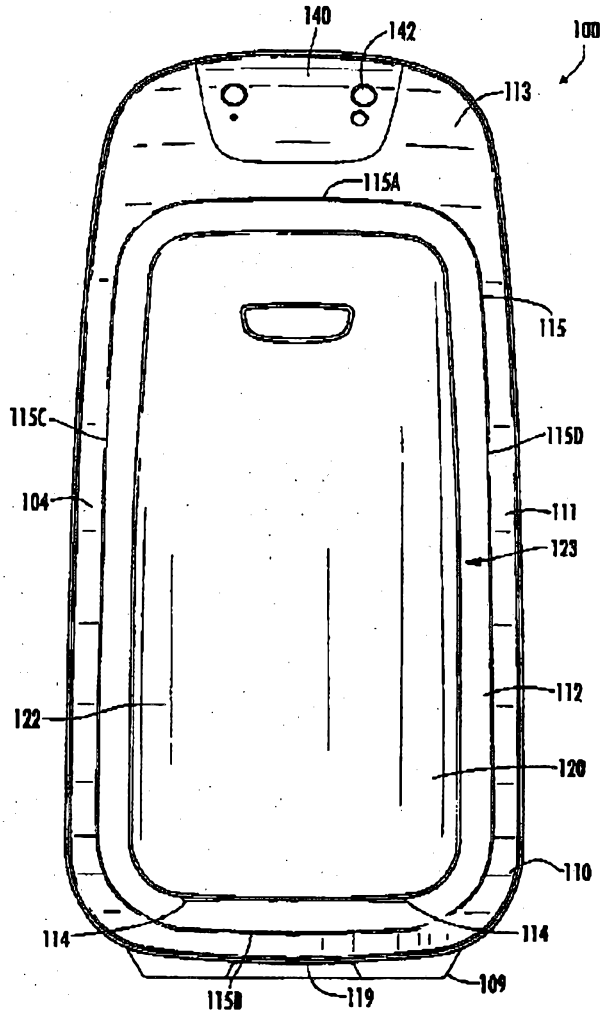


FIG. 1D

2010200246 22 Jan 2010

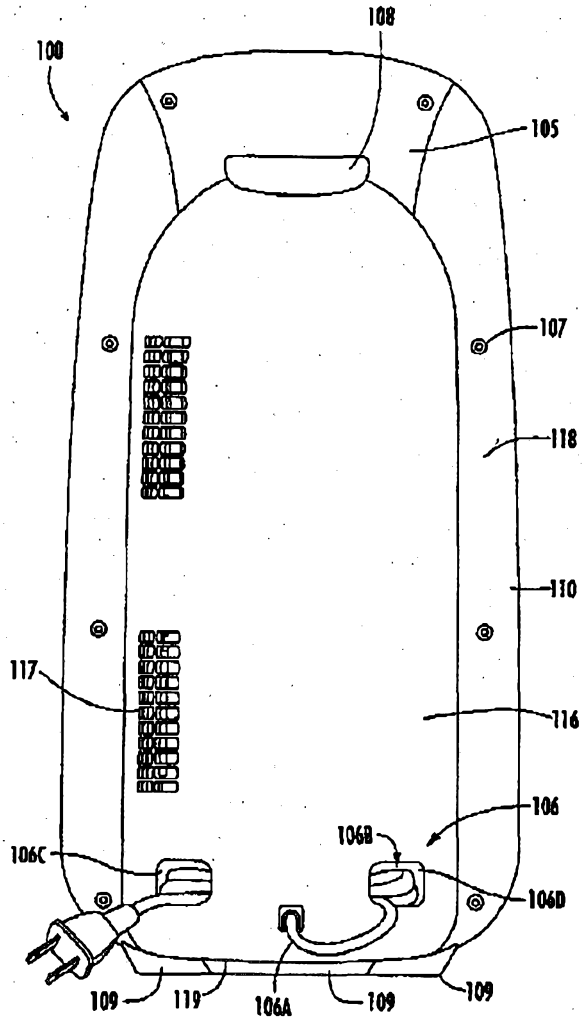


FIG. 1E

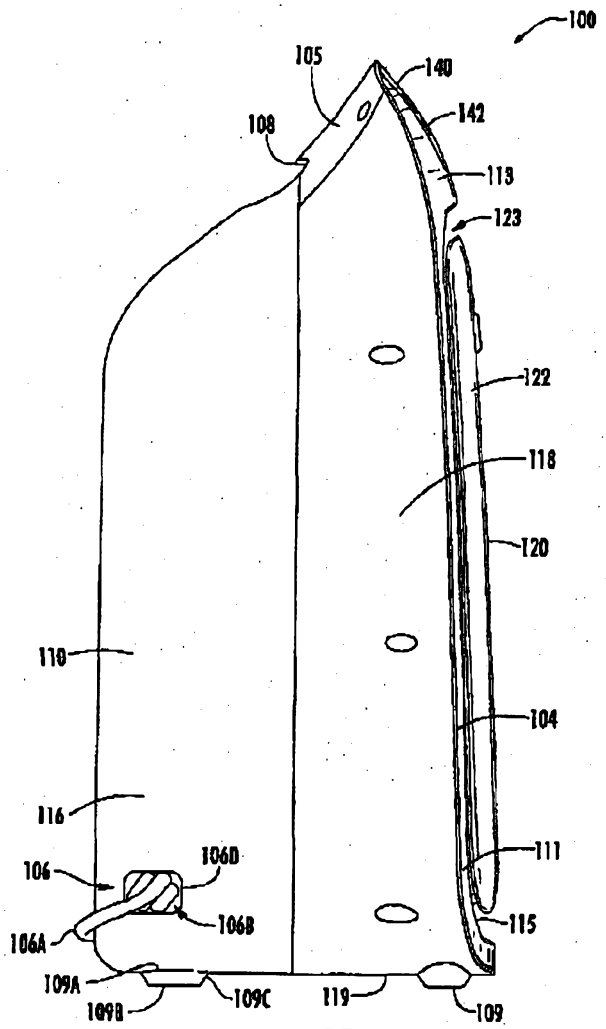


FIG. 1F

2010200246 22 Jan 2010

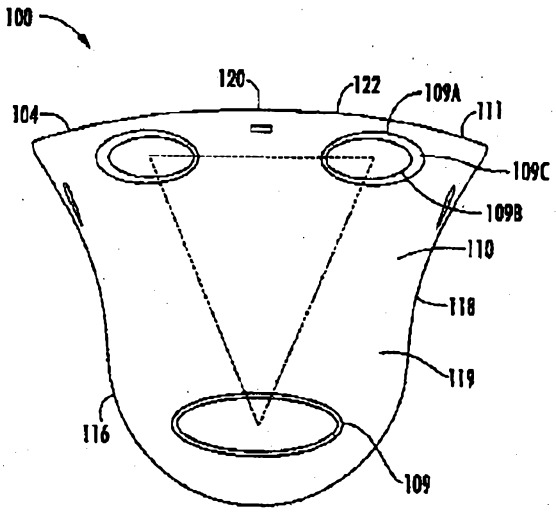
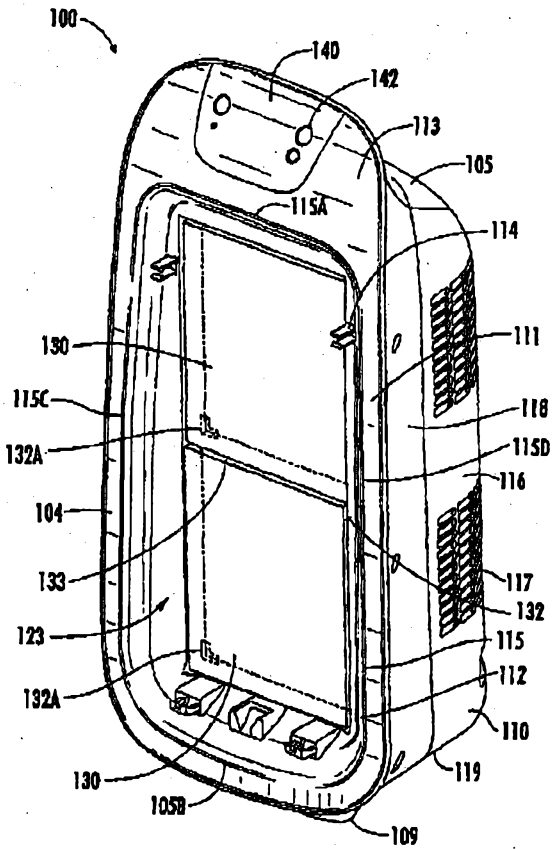


FIG. 1G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140
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115A
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115C
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132A
115D
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117
132
123
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112
192A
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130
119
105B
109

FIG. 1H

22 Jan 2010 2010200246

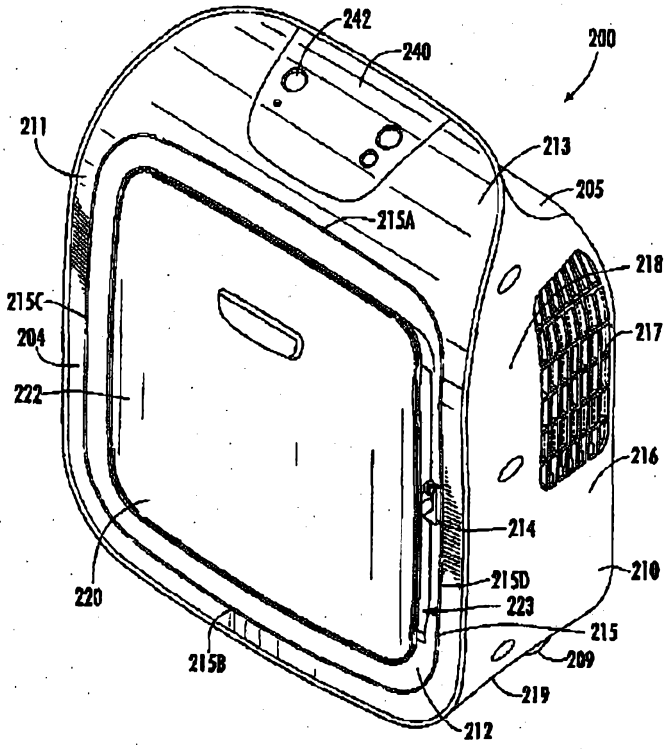


FIG. 2A

2010200246 22 Jan 2010

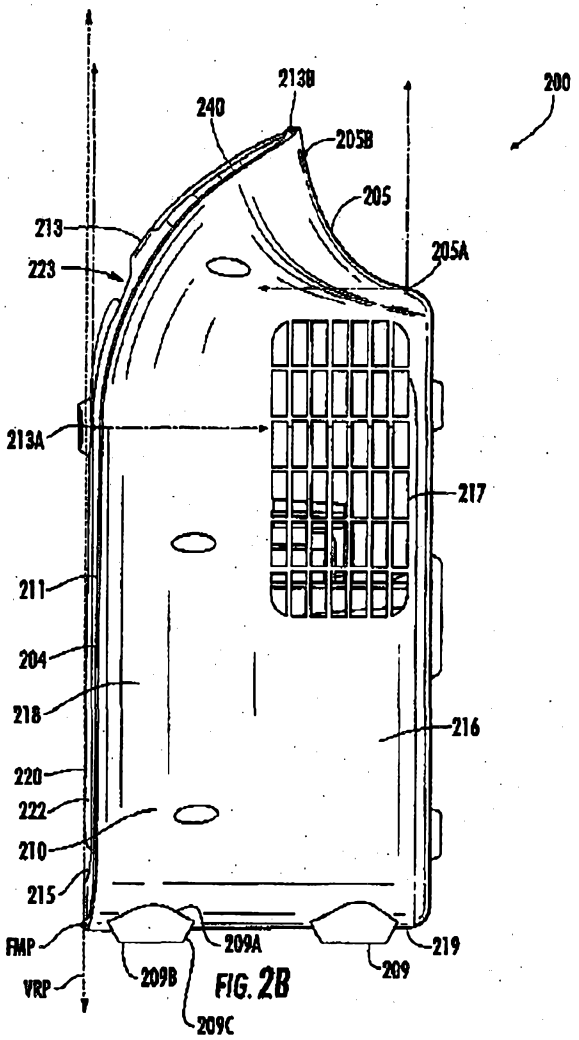


FIG. 2B

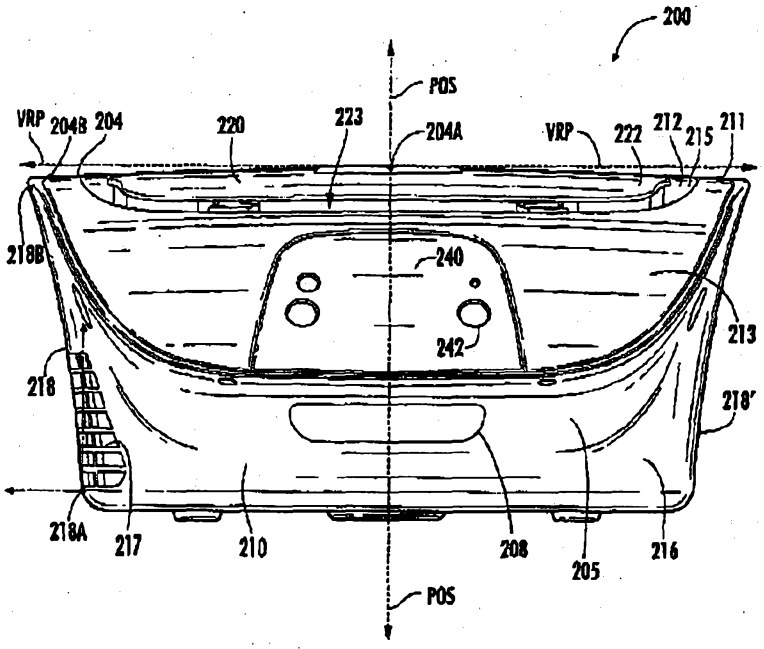


FIG. 2C

22 Jan 2010
2010200246

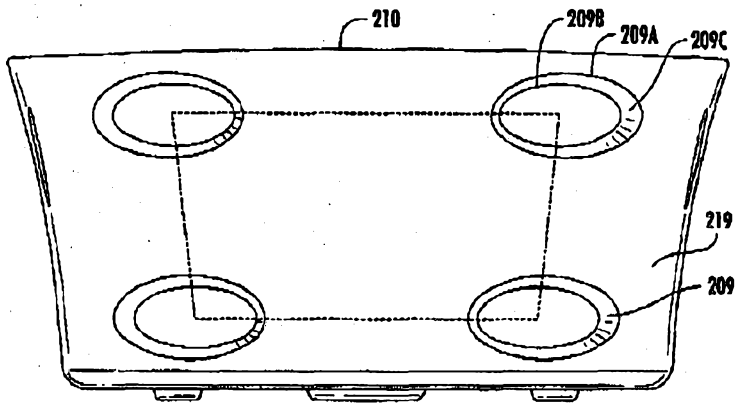


FIG. 2D

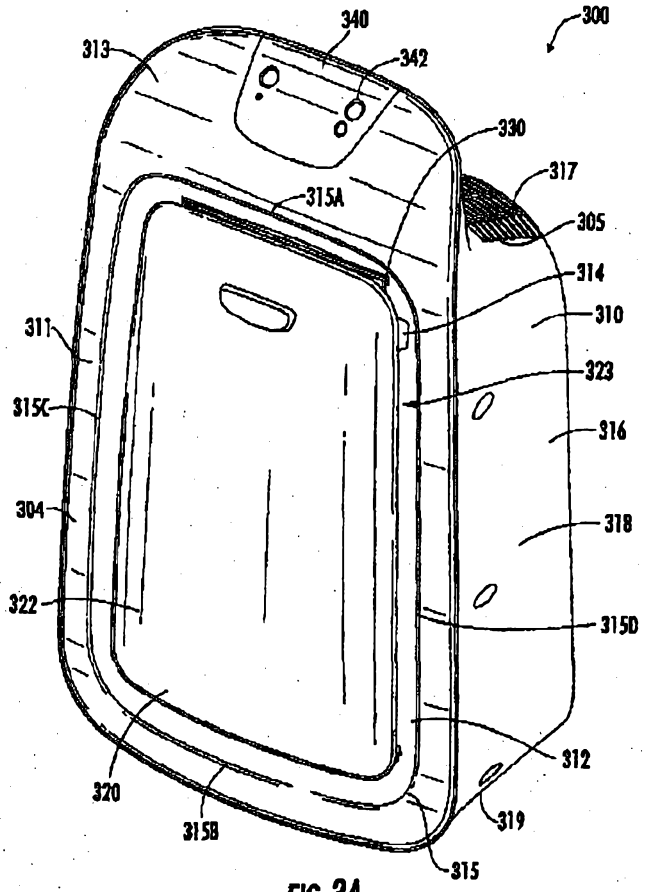


FIG. 3A

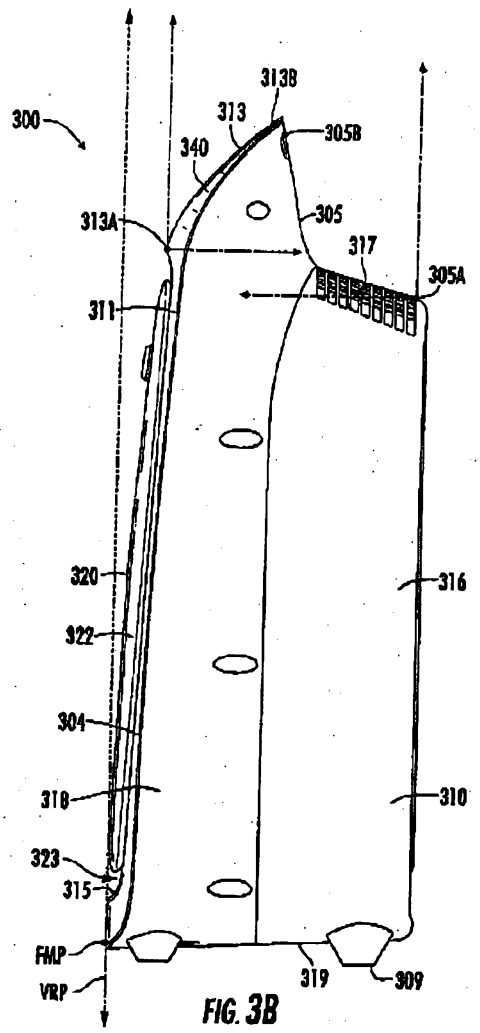


FIG. 3B

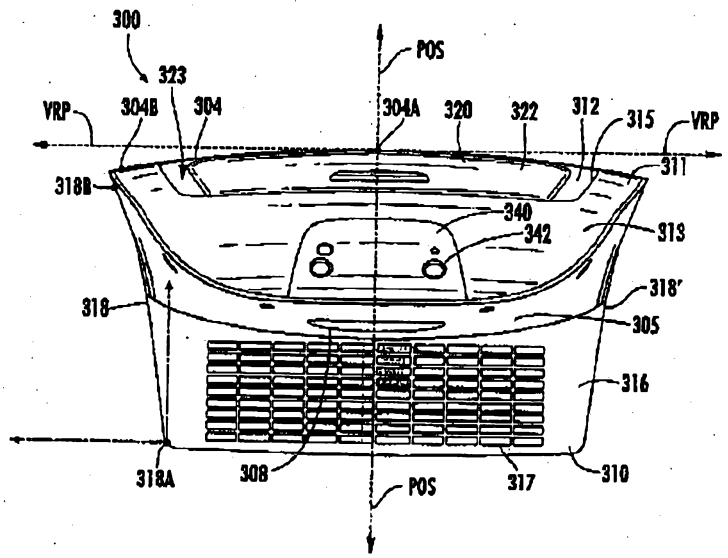


FIG. 3C

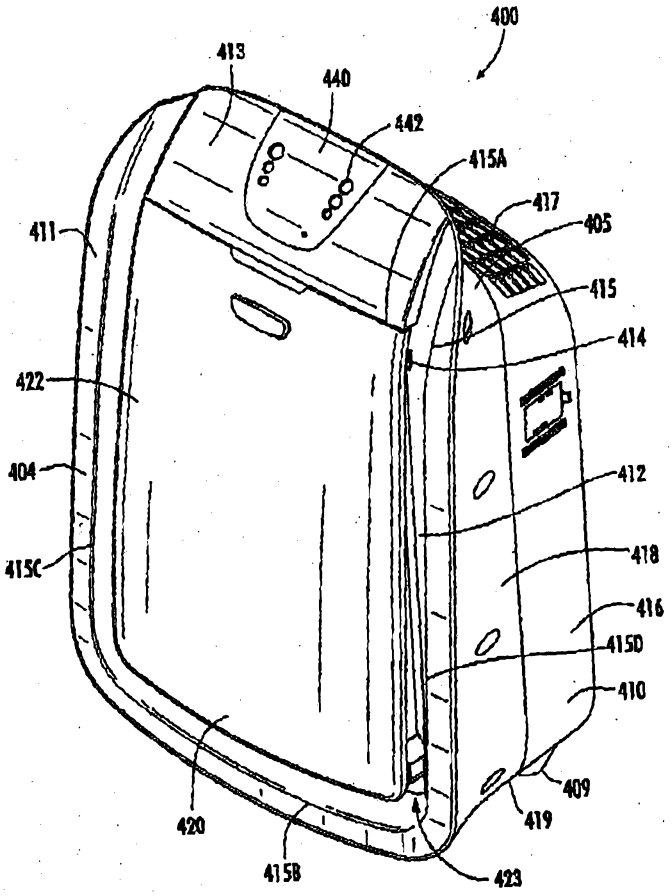


FIG. 4A

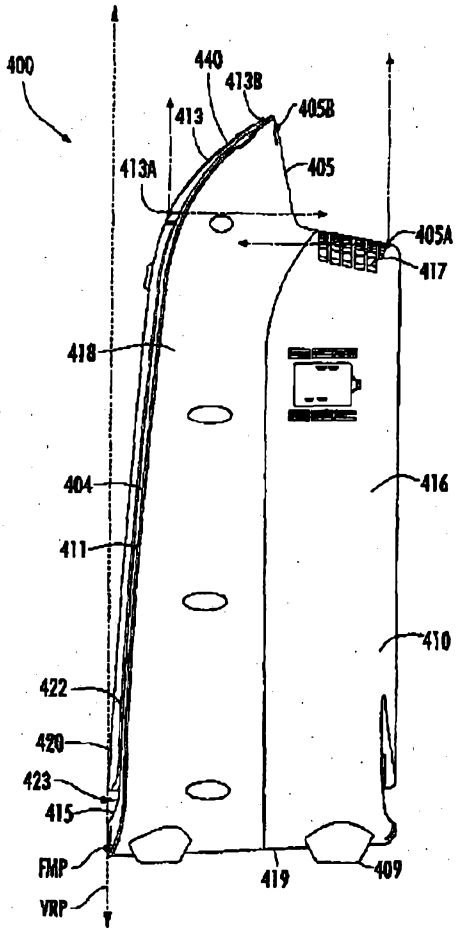


FIG. 4B

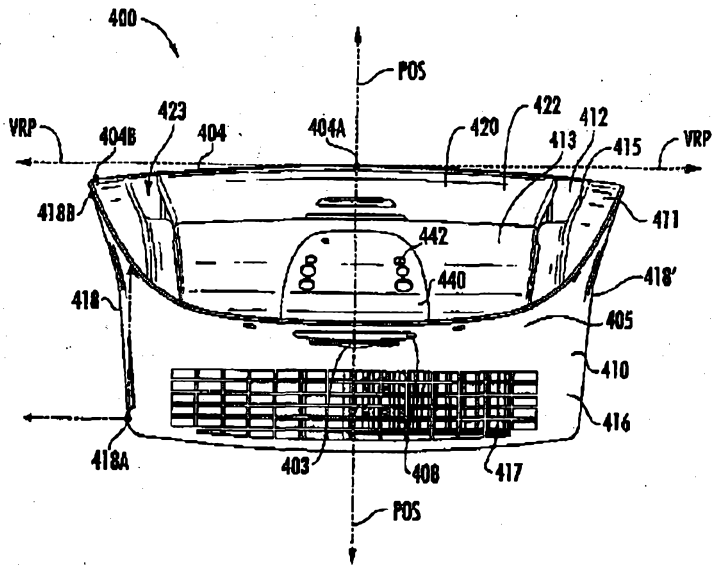


FIG. 4C

2010200246 22 Jan 2010

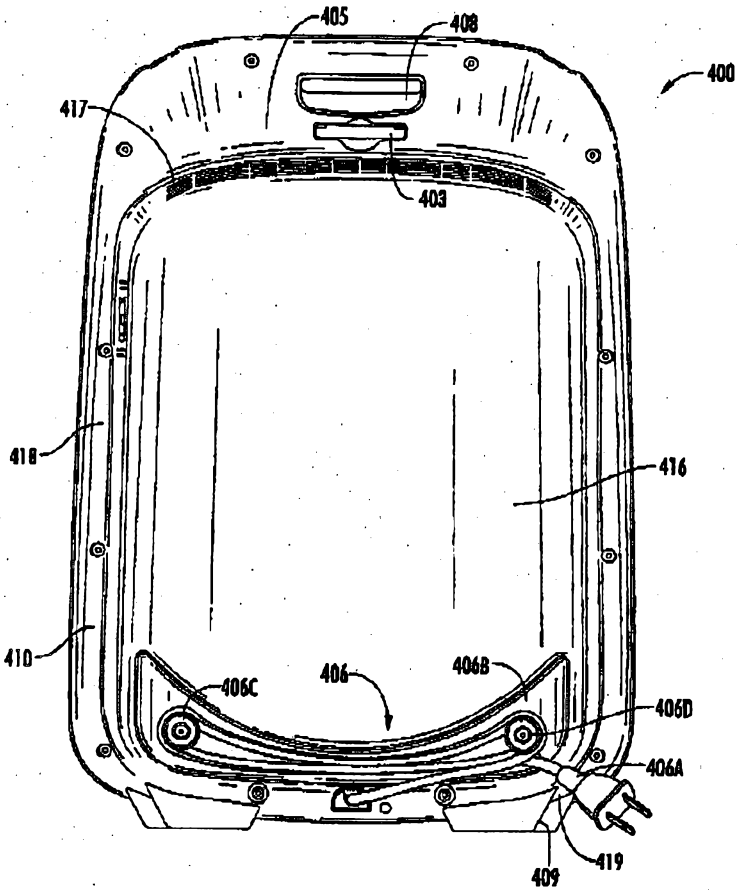


FIG. 4D

2010200246 22 Jan 2010

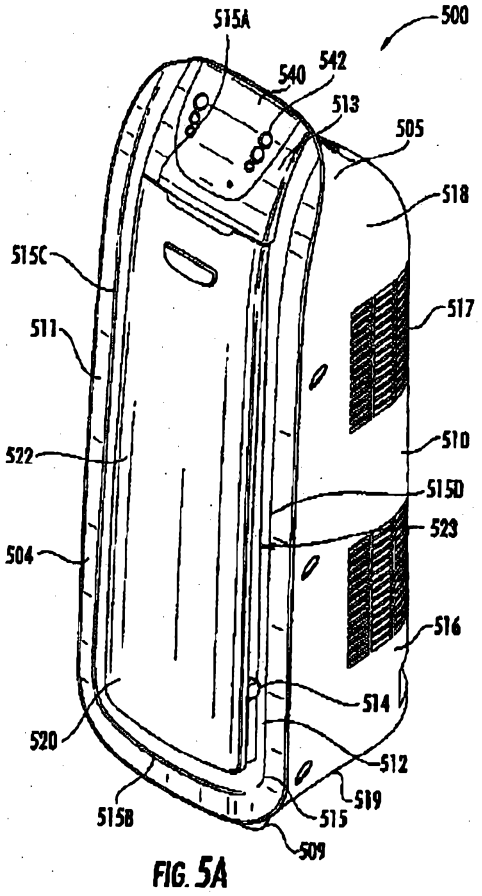
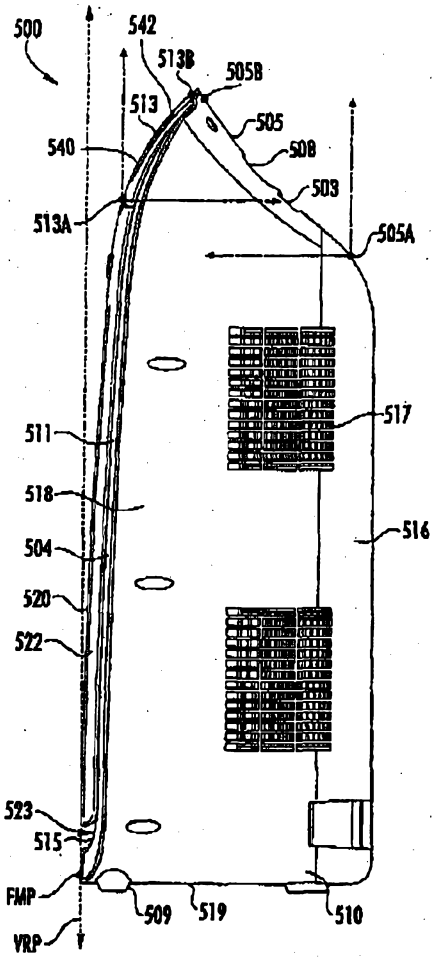


FIG. 5A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FMP
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VRP

FIG. 5B

2010200246 22 Jan 2010

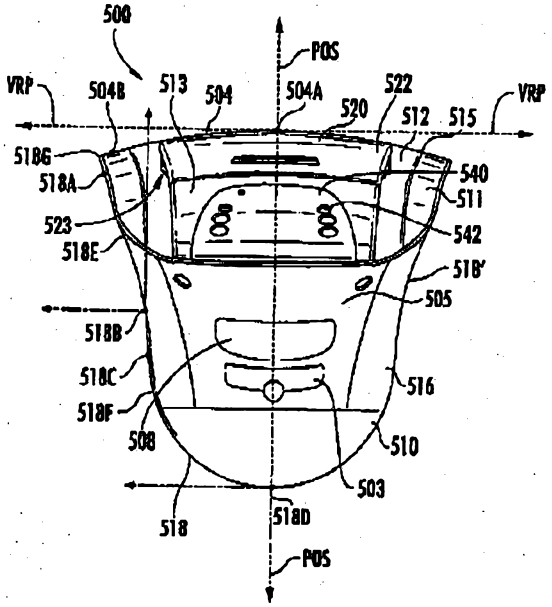

FIG. 5C