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(54) **OLFACTORY SIMULATION SYSTEM FOR HEAD-MOUNTED DISPLAYS**

(71) Applicant: **Ball State Innovation Corporation**, Muncie, IN (US)

(72) Inventors: **Joshua A. Raines**, Muncie, IN (US); **Daniel E. Litt**, Muncie, IN (US)

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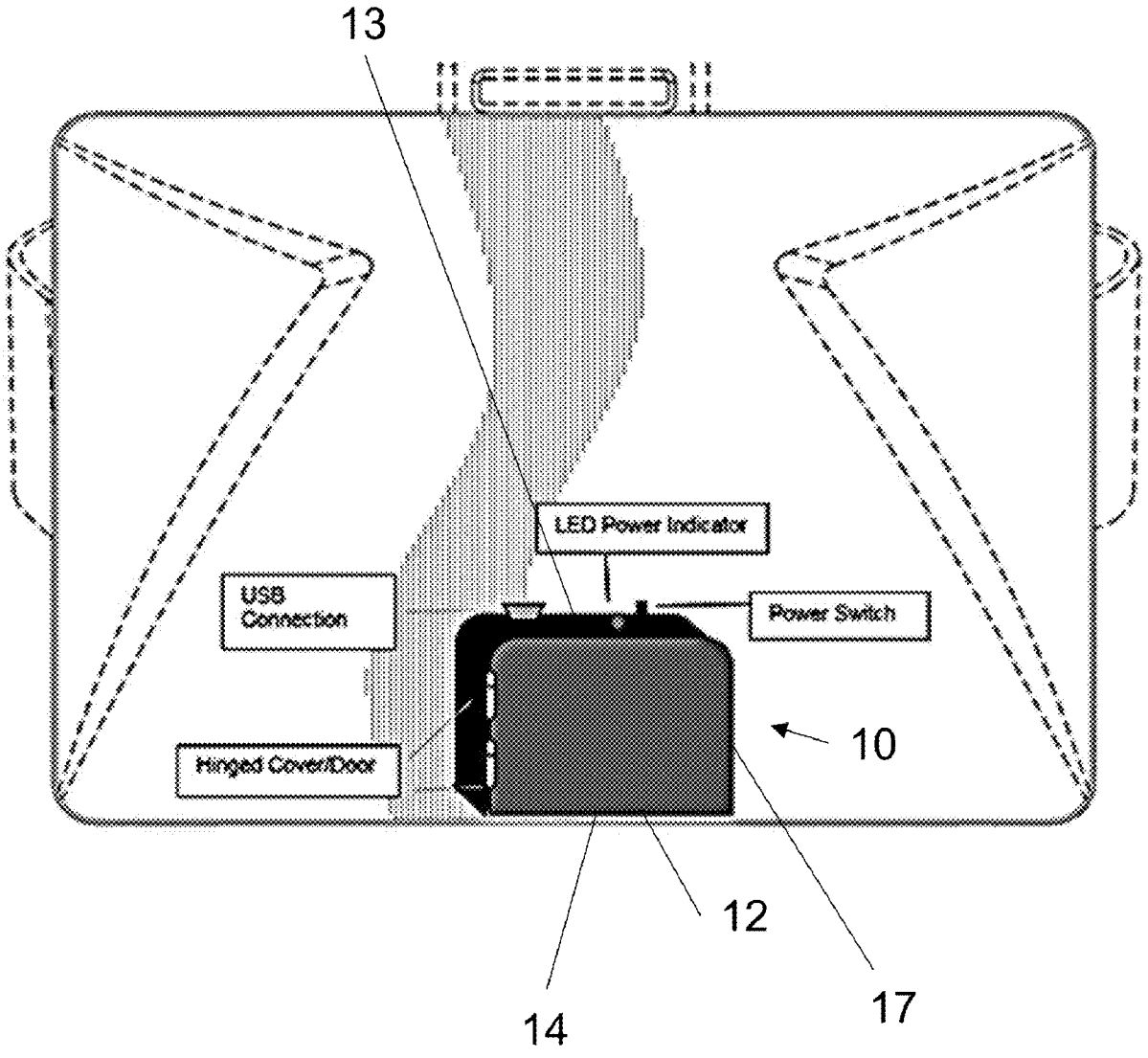
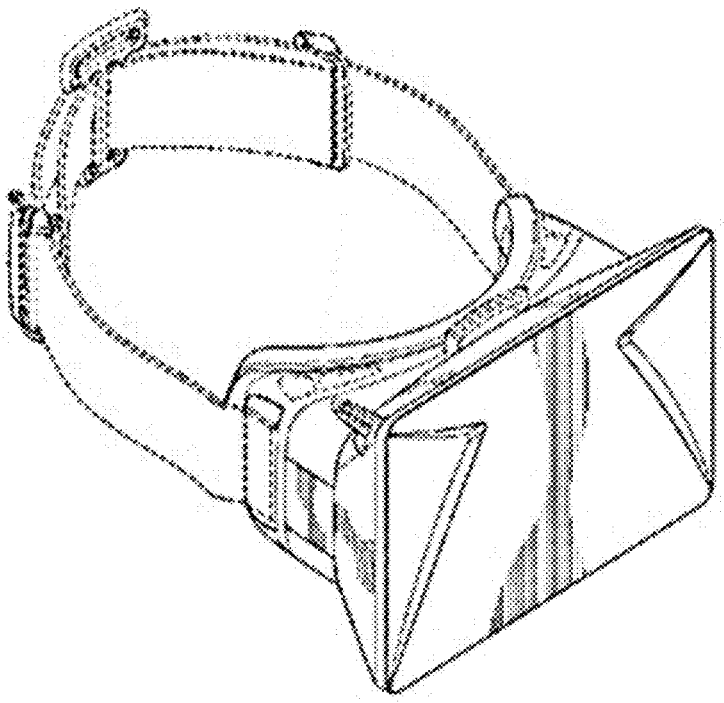
CPC ***B05B 7/0081*** (2013.01); *G06F 3/011* (2013.01)

(57) **ABSTRACT**

An olfactory simulation system is adapted to attach to a virtual reality (VR) or augmented reality (AR) headset to disperse selected scent(s) to the user. The system utilizes a wireless microcontroller to rotate one of a cartridge housing and a base with respect to the other, making one of a plurality of available chambers carried by cartridge housing accessible, while keeping the other chambers carried by the cartridge housing substantially sealed from ambient air. A cartridge carried within the chamber carries a scented material. A fan arranged near the cartridge housing diffuses the selected scent near, but spaced apart from, the user's nose at varying intervals, based on a desired strength.





Prior Art

FIG. 1A

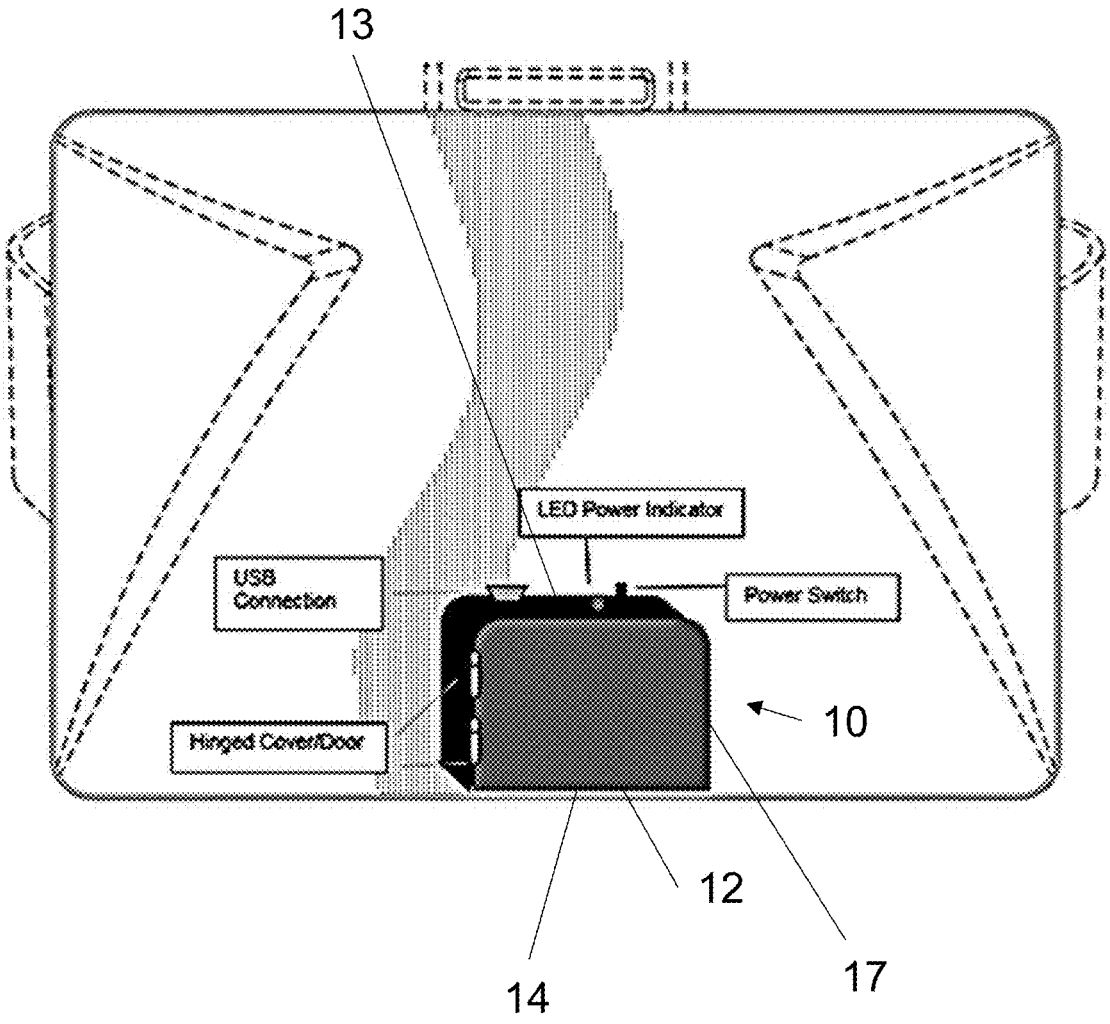

13
LED Power Indicator
USB Connection
Power Switch
Hinged Cover/Door
10
12
14
17

FIG. 1B

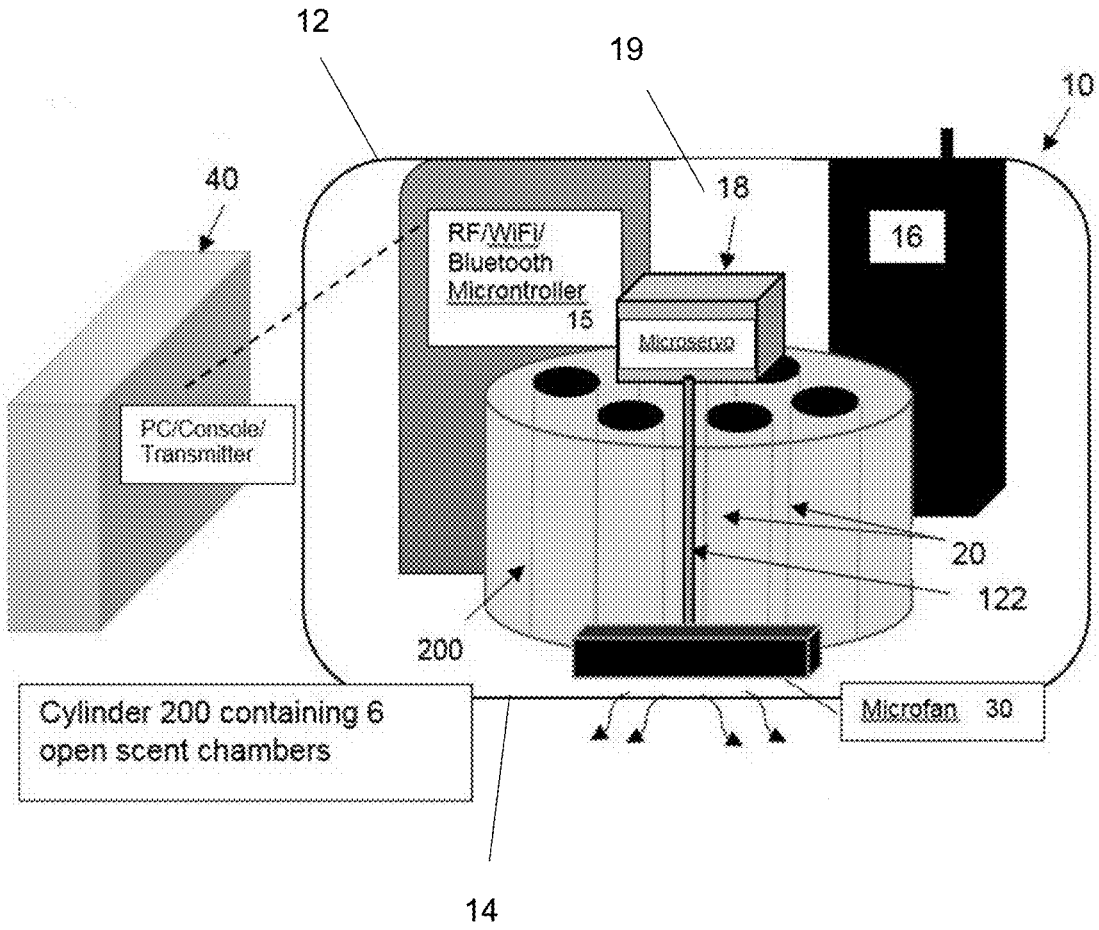

12
19
10
40
18
16
RF/WiFi/
Bluetooth
Microntroller
15
Microservo
PC/Console/
Transmitter
20
122
200
Microfan 30
Cylinder 200 containing 6
open scent chambers
14

FIG. 2

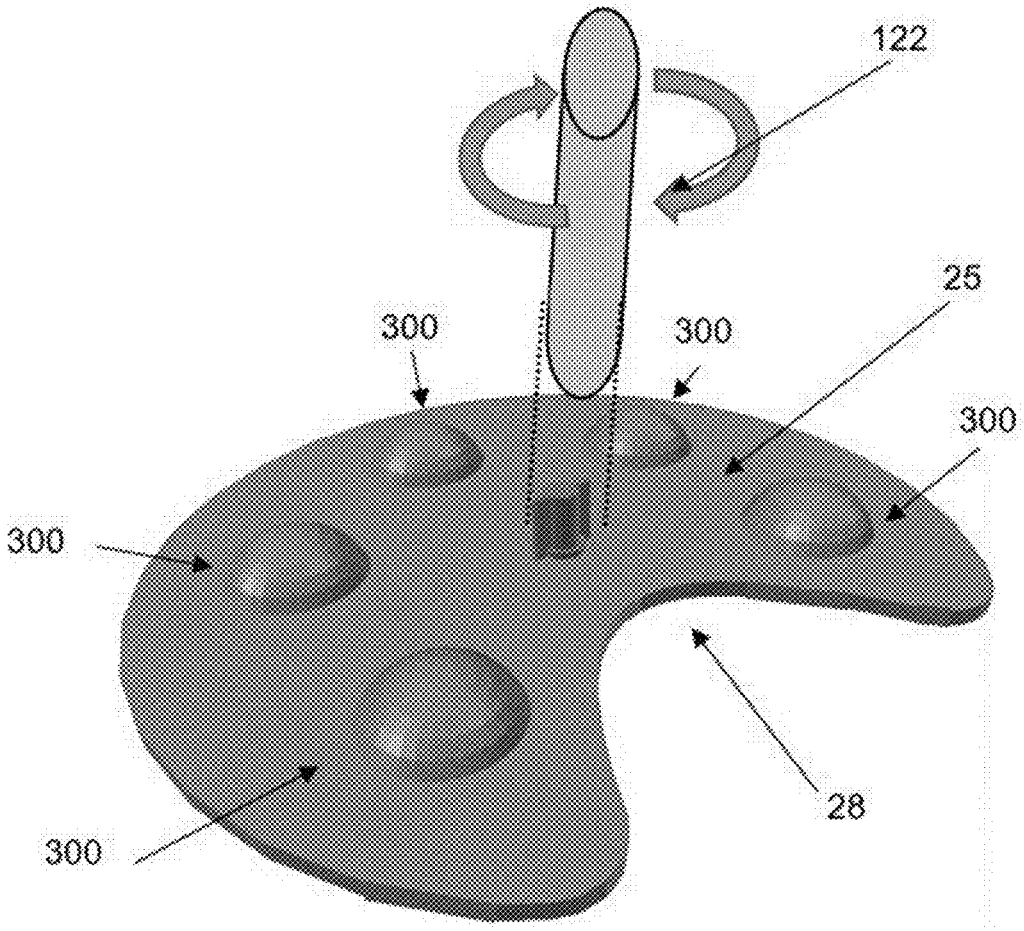


FIG. 3

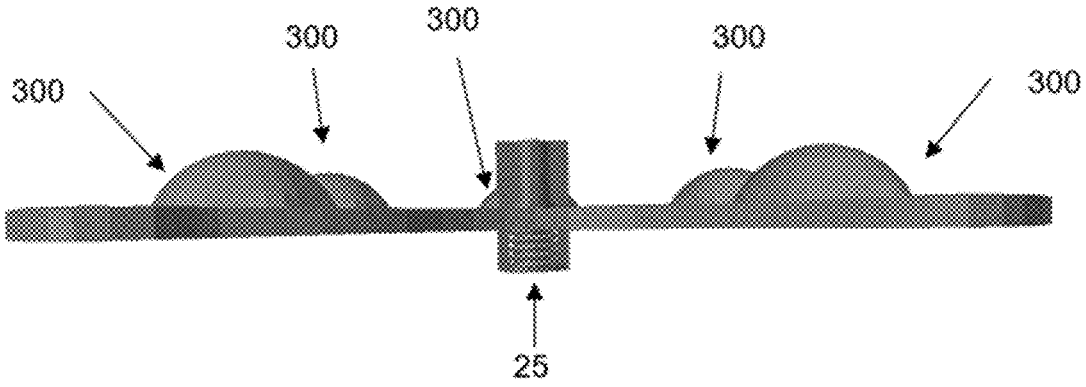


FIG. 4

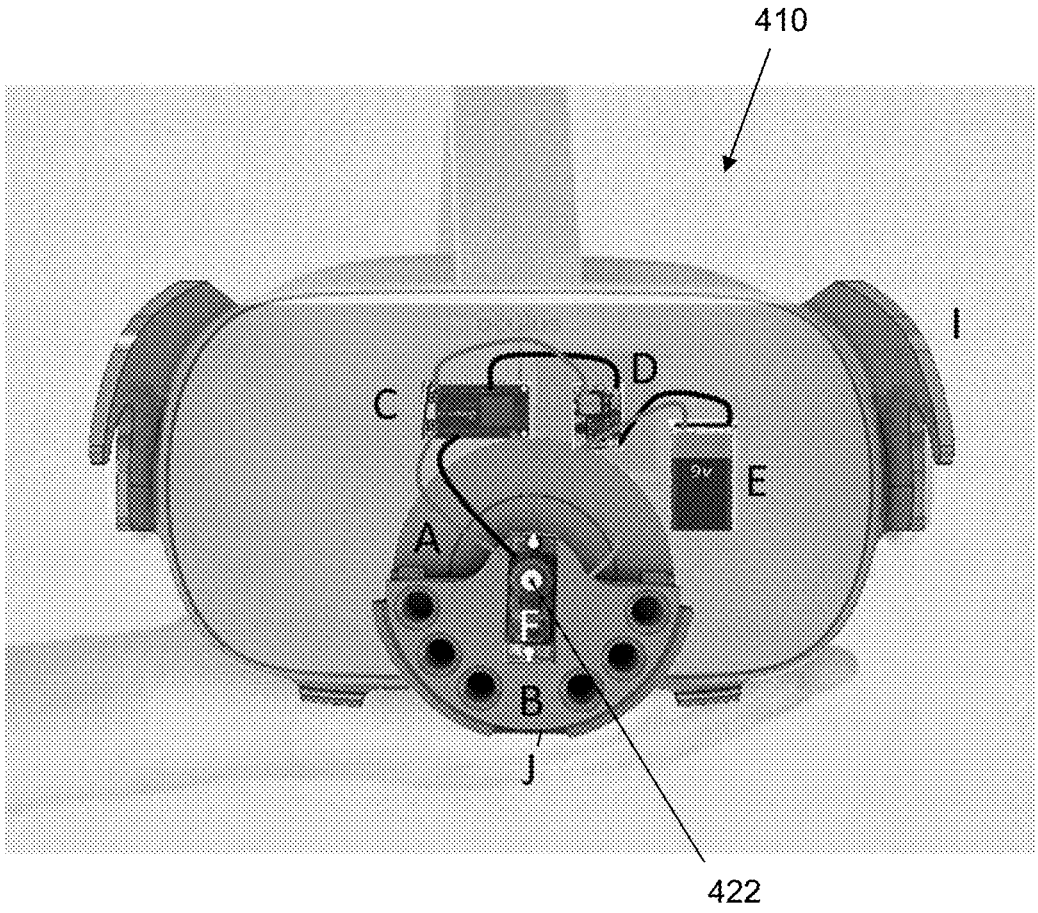


FIG. 5

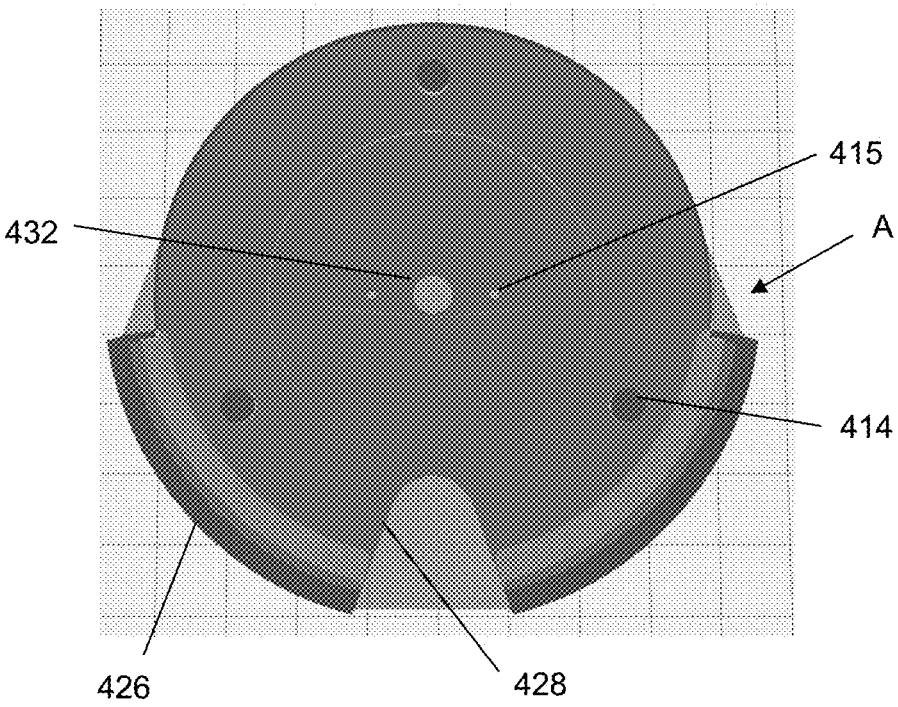


FIG. 6A

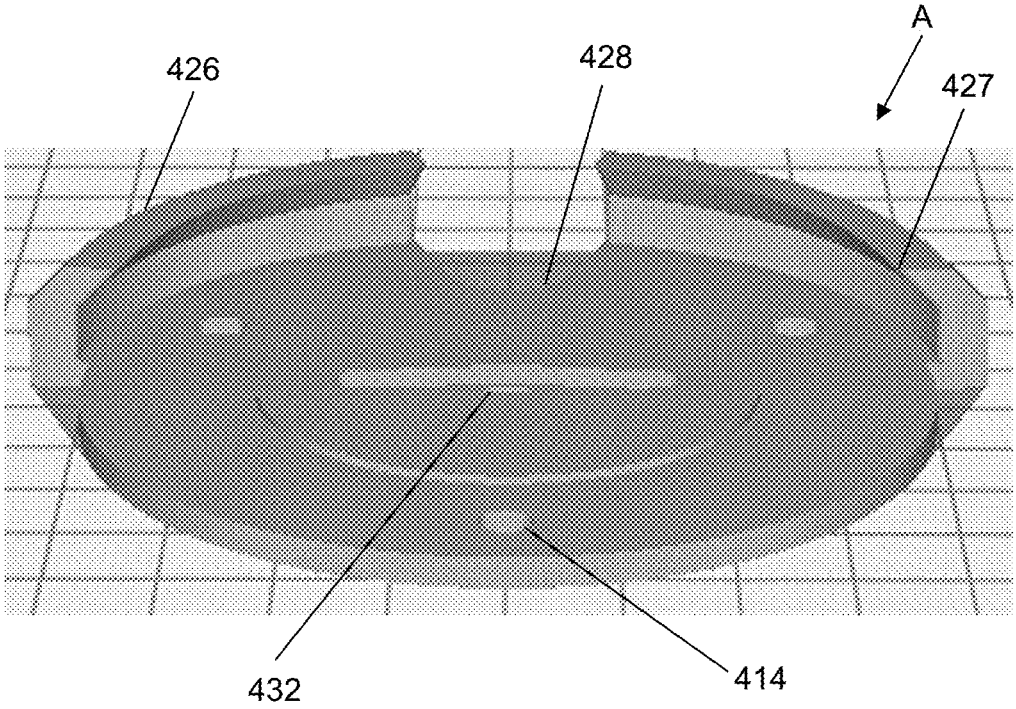


FIG. 6B

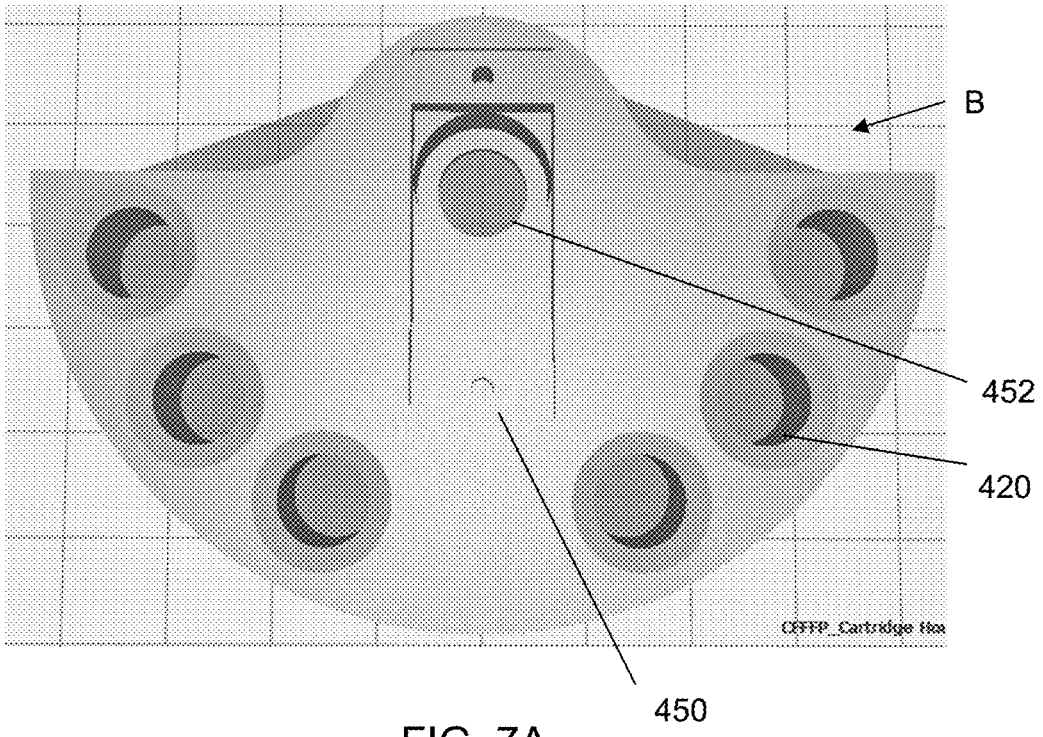


FIG. 7A

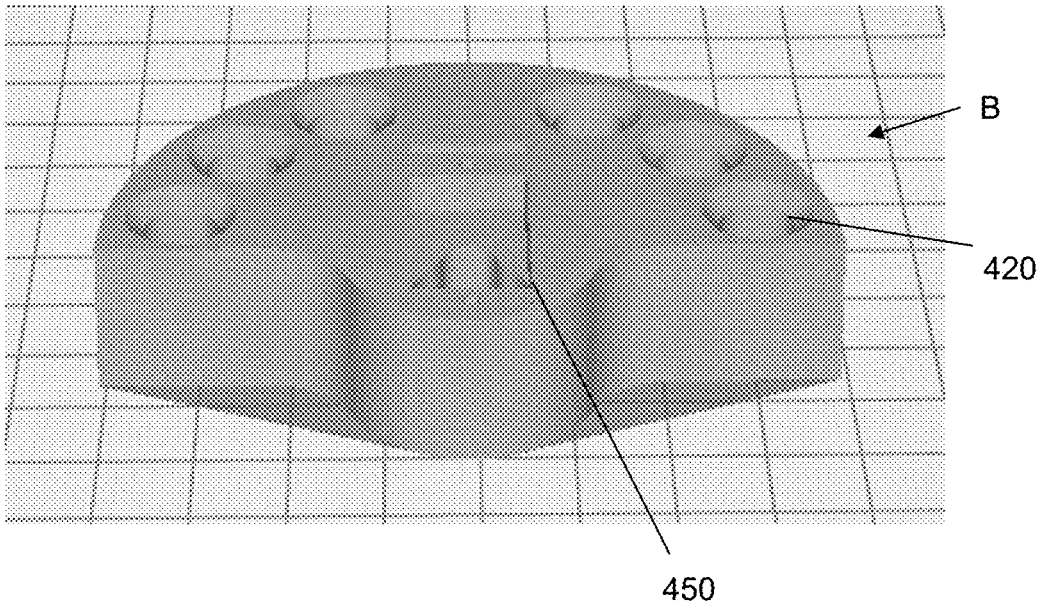


FIG. 7B

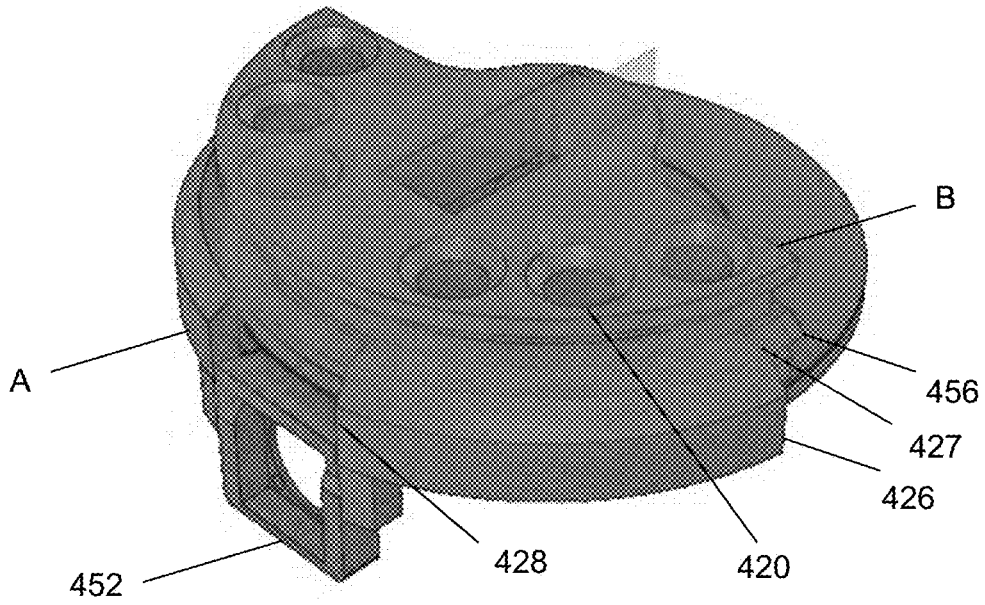


FIG. 7C

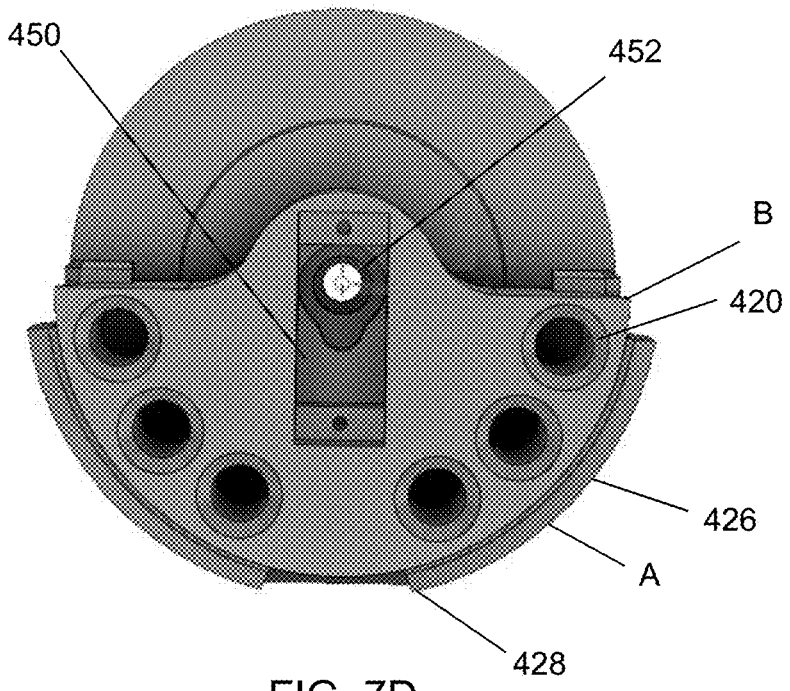


FIG. 7D

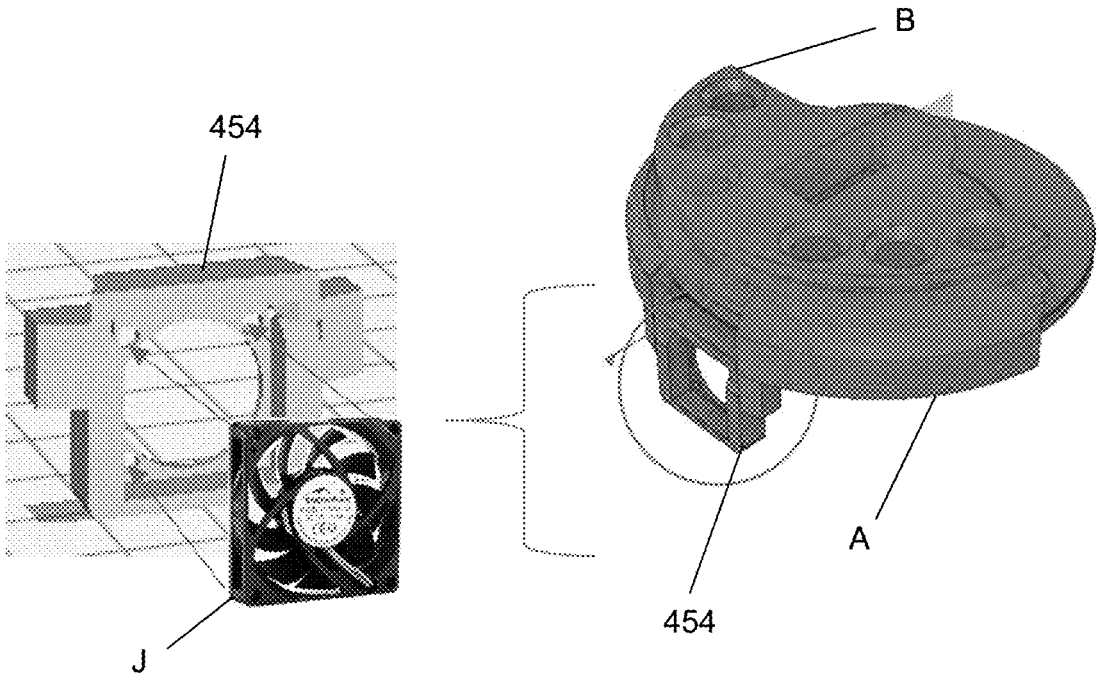


FIG. 7E

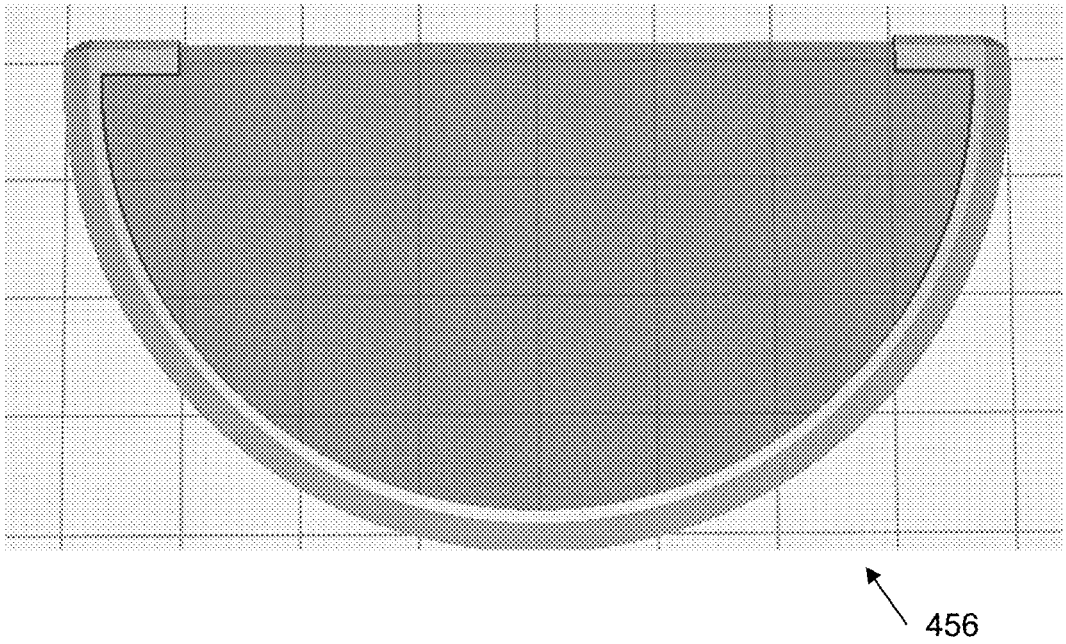


FIG. 8A

FIG. 8B

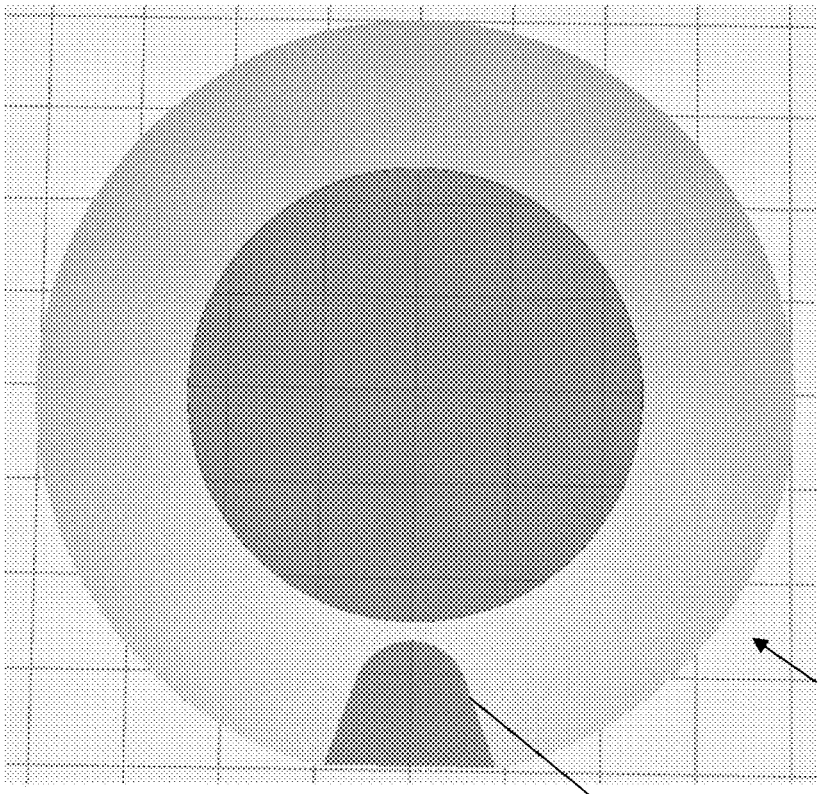


FIG. 9A

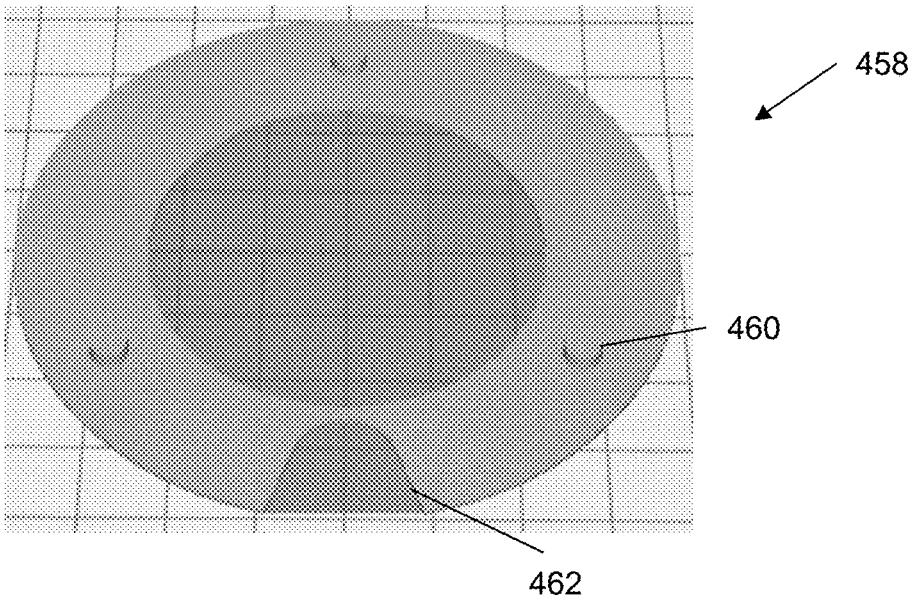


FIG. 9B

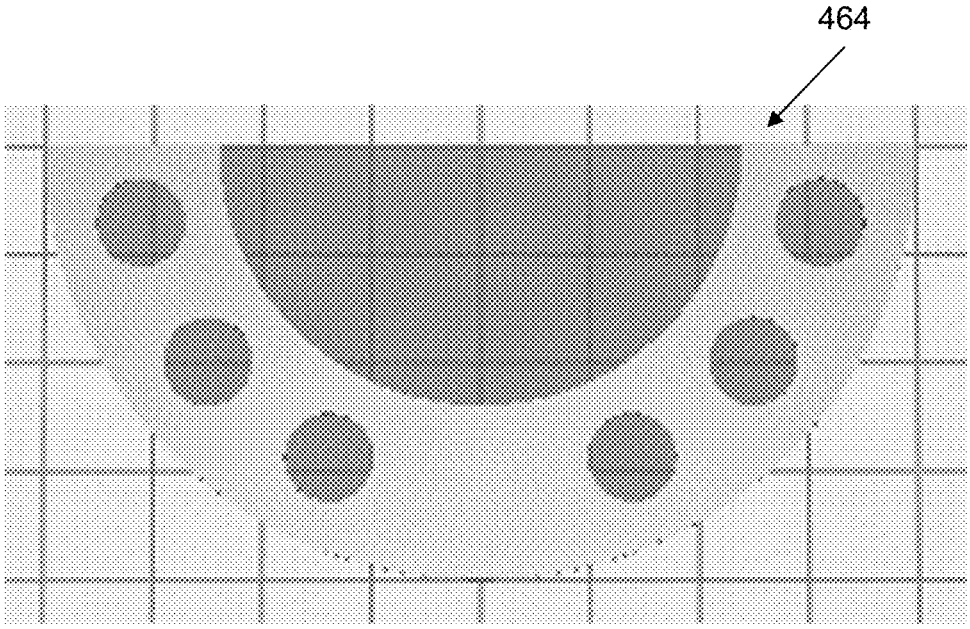


FIG. 10

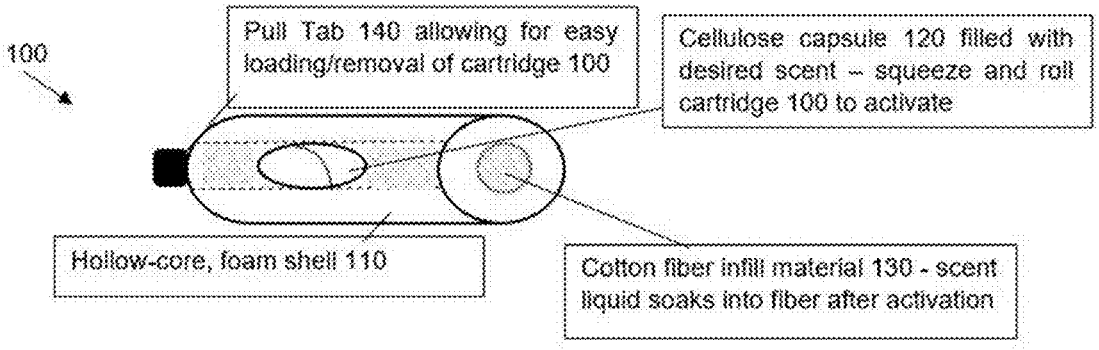

100
Pull Tab 140 allowing for easy loading/removal of cartridge 100
Cellulose capsule 120 filled with desired scent – squeeze and roll cartridge 100 to activate
Hollow-core, foam shell 110
Cotton fiber infill material 130 - scent liquid soaks into fiber after activation

FIG. 11

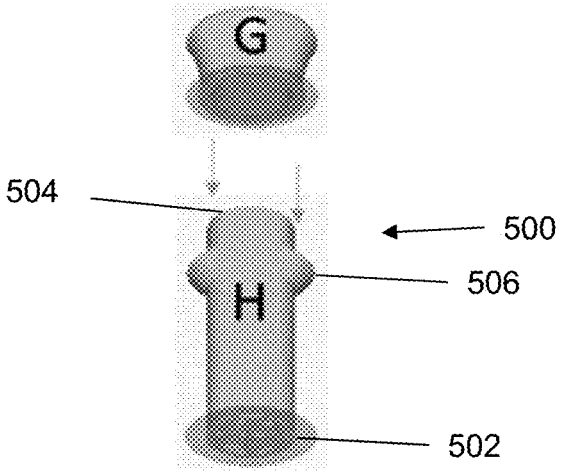

G
504
500
506
H
502

FIG. 12

OLFACTORY SIMULATION SYSTEM FOR HEAD-MOUNTED DISPLAYS

CROSS REFERENCE TO RELATED APPLICATION

[0001] The present invention claims the benefit of priority to U.S. Provisional Patent Application Ser. No. 62/753,493, titled UNIVERSAL 4D-ATTACHMENTS FOR HEAD-MOUNTED DISPLAYS WITH OLFACTORY SIMULATION, filed Oct. 31, 2018, incorporated herein by reference.

FIELD

[0002] An olfactory simulation system is adapted to attach to a virtual reality (VR) or augmented reality (AR) headset to disperse selected scent(s) to the user. The system utilizes a wireless microcontroller to rotate one of a cartridge housing and a base with respect to the other, making one of a plurality of available chambers carried by cartridge housing accessible, while keeping the other chambers carried by the cartridge housing substantially sealed from ambient air. A cartridge carried within the chamber carries a scented material. A fan arranged near the cartridge housing diffuses the selected scent near, but spaced apart from, the user's nose at varying intervals, based on a desired strength.

BACKGROUND

[0003] Conventional scent delivery augmentation systems include those shown and described in U.S. Pat. Nos. 9,925,458; 9,925,459; 10,065,113; and 9,907,876. Such systems typically place a user's face in a closed/sealed facemask, and use aerosols dispensed through a hole disposed directly in front of the user's nose to deliver the scent. It would be difficult to determine whether the release of an olfactory cue is being processed as it would in natural reality, or if the user is sensitive to the pressure change produced by a release of aerosol gas in close proximity to the sphenoid, thereby possibly causing false innervation.

[0004] A significant drawback of the aforementioned prior art methods is that each system leaves undissipated residue within a sealed facemask. As these aerosol-delivered particles settle within the mask, any new activations/scents will always include trace elements of the previously discharged aerosols. Such methods are not suited for a broad range of scents (e.g., unpleasant smells, such as those used in training simulations to help identify [virtual] spaces used in the manufacture of opioids, or checking appliances for the odor of gas leaks). The discharge of pressurized aerosol in a closed system could also falsely activate the olfactory reactions to sudden pressure change, causing false innervation structures in the sphenoid/paranasal system.

SUMMARY

[0005] The disclosed sensory augmentation system is distinguishable over the prior art for many reasons, one of which being that it utilizes disposable scent cartridges instead of discharging aerosol sprays in close proximity to a user's nasal cavity within a sealed environment (i.e., the facemask). The conventional systems discussed above leave undissipated residues behind, making such systems unable to readily accommodate unpleasant smells without thorough cleaning of the apparatus after each use. The universal-fit, open design of the current invention (rather than a closed aerosol system used in the prior art) makes this a more natural form of sensory augmentation, thus serving as a novel improvement in scent dispersion hardware and its ability to immerse users, especially when being used in psychotechnic applications such as training/simulation activities.

[0006] In some embodiments, the present invention includes an olfactory simulation system comprising a base including a cutout; a cartridge housing including a plurality of chambers; and a servo operatively coupled to the base and the cartridge, the servo configured to rotate one of the base and the cartridge housing with respect to the other of the base and the cartridge housing to align one of the plurality of chambers with the cutout; wherein each of the plurality of chambers not aligned with the cutout are sealed. In some embodiments, the system further includes a container including a top, bottom, and at least one side extending between the top and the bottom, the container having an interior; and wherein the cartridge housing and the base are located within the interior.

[0007] In further embodiments, the base includes at least one stopping element shaped to at least partially insert into the chamber and substantially seal the chamber. In certain embodiments, the base includes a number of stopping elements shaped to substantially seal the plurality of chambers, and wherein the plurality of chambers exceeds the number of stopping elements by one. In some embodiments, the system further includes a shaft extending between the servo and the base.

[0008] In further embodiments, the system further includes a microcontroller operatively coupled to the servo. In certain embodiments, the microcontroller is configured to receive a signal from a computing system and activate the servo pursuant to the signal. In some embodiments, the computing system is in wireless communication with the microcontroller. In further embodiments, the system further includes a fan and a microcontroller operatively coupled to the fan. In certain embodiments, the microcontroller is configured to receive a signal from a computing system and activate the fan pursuant to the signal.

[0009] In some embodiments, the system further includes a container including a top, bottom, and at least one side extending between the top and the bottom, the container having an interior; and wherein the cartridge housing, the base, the microcontroller, and the fan are located within the interior. In further embodiments, the container includes at least one vent, and wherein the fan configured to guide air from the interior through the at least one vent. In certain embodiments, the container is spaced apart from a user's nose. In some embodiments, the system further includes means for removably attaching the container to a headset. In further embodiments, the system includes a mount configured to removably attach to a headset; and wherein the base is attached to the mount. In certain embodiments, the system includes a gasket positioned between the base and the cartridge housing, the gasket forming a slidable seal between the base and the cartridge housing. In some embodiments, the base includes a raised ridge shaped to receive a portion of the cartridge housing.

[0010] In further embodiments, the system includes at least one scent cartridge configured to fit within one of the plurality of chambers. In certain embodiments, the scent cartridge includes a shell, the shell having a scent capsule and infill material therewithin. In some embodiments, the shell is constructed to be deformable by hand, and wherein

the scent capsule is constructed to be fracturable by hand. In further embodiments, the scent capsule contains a scented liquid, gas, or solid. In certain embodiments, the scent capsule contains a scented liquid. In some embodiments, the infill material is composed of material to absorb or adsorb the scented liquid. In further embodiments, the scent cartridge includes a cylindrical shell for containing a scented material, the shell having an open end and a vented end opposite end the open end, and a cap for removably sealing the open end.

BRIEF DESCRIPTION OF THE DRAWINGS

[0011] The above-mentioned and other features of this disclosure, and the manner of attaining them, will become more apparent and the disclosure itself will be better understood by reference to the following description of embodiments of the disclosure taken in conjunction with the accompanying drawings, wherein:

[0012] FIG. **1**A illustrates an exemplary conventional headset to which the invention may be attached.

[0013] FIG. **1**B illustrates a front plan view of a head-mounted display with a first embodiment of the invention attached thereto.

[0014] FIG. **2** illustrates a front view of the interior of the container according to the first embodiment.

[0015] FIG. **3** illustrates in isolation the shaft and base of the first embodiment that interacts with the cartridge housing shown in FIG. **2**.

[0016] FIG. **4** illustrates a forward view in isolation of the stopper element of the shaft shown in FIG. **3**.

[0017] FIG. **5** illustrates a front plan view of a head-mounted display with a second embodiment of the invention attached thereto.

[0018] FIG. **6**A illustrates a front plan view of a base according to the second embodiment.

[0019] FIG. **6**B illustrates a top perspective view of the base of FIG. **6**A.

[0020] FIG. **7**A illustrates a front plan view of a cartridge housing according to the second embodiment.

[0021] FIG. **7**B illustrates a top perspective view of the cartridge housing of FIG. **7**A.

[0022] FIG. **7**C illustrates a bottom side perspective view of the cartridge housing carried on the base.

[0023] FIG. **7**D illustrates a front plan view of the cartridge housing carried on the base.

[0024] FIG. **7**E illustrates the relative positioning of the fan, frame, cartridge housing, and base.

[0025] FIG. **8**A illustrates a front plan view of a spring gasket according to the second embodiment.

[0026] FIG. **8**B illustrates a top perspective view of the spring gasket of FIG. **8**A.

[0027] FIG. **9**A illustrates a front plan view of a base gasket according to the second embodiment.

[0028] FIG. **9**B illustrates a rear plan view of the base gasket of FIG. **9**A.

[0029] FIG. **10** illustrates a top plan view of a back gasket according to the second embodiment.

[0030] FIG. **11** illustrates a first exemplary scent cartridge.

[0031] FIG. **12** illustrates a second exemplary scent cartridge.

[0032] Corresponding reference characters indicate corresponding parts throughout the several views. Although the drawings represent embodiments of the present disclosure, the drawings are not necessarily to scale and certain features may be exaggerated in order to better illustrate and explain the present disclosure.

DETAILED DESCRIPTION OF THE EXEMPLARY EMBODIMENTS

[0033] The embodiments disclosed below are not intended to be exhaustive or limit the disclosure to the precise forms disclosed in the following detailed description. Rather, the embodiments are chosen and described so that others skilled in the art may utilize their teachings.

[0034] FIG. **1**A shows an exemplary virtual reality headset to which the present invention system **10**, **410** could be attached. Such a conventional headset is available from Oculus VR, LLC (Menlo Park, Calif.), and is the subject of U.S. Design Pat. No. D738,374.

[0035] As shown in FIG. **1**B, a first embodiment of an olfactory simulation system **10** includes a container **12** having a top **13**, bottom **14**, and at least one side **17** extending between the top **13** and bottom **14**, such that top **13**, bottom **14**, and at least one side **17** define an interior **19** of the container **12**. The container **12** is preferably secured via conventional means (e.g., adhesive, hook-and-loop style fasteners attached to the system **10** and headset, friction fit, snap fit, etc.) near the bottom edge of the front side of the headset so the scents are dispersed by the invention downwardly toward the user's nose and nasal passages, but the user's nose remains external to the system **10**. In some embodiments, such as shown in FIG. **1**B, the container **12** includes a LED power indicator, a power switch to activate or deactivate the system **10**, a USB connection port or other means for accepting wired connectivity from a computing system, and a hinged cover or door allowing access to the interior **19** of the container **12**.

[0036] As shown in FIGS. **2-4**, an olfactory simulation system **10**, which is adapted to attach to the front of a VR or AR headset to disperse selected scent(s) to the user, is described herein. In a current embodiment, the system **10** utilizes a wireless microcontroller **15** to rotate a shaft **122** to one of six (6) available chambers **20** carried by a cylindrical cartridge housing **200**, while keeping the other chambers sealed from ambient air. A small fan **30**, such as a microfan, arranged at the bottom **14** of the container **12**, guides the selected scent out from the interior **19**, through the at least one vent (not shown, on bottom of housing **200**), near the user's nose at varying intervals, based on a desired strength and controlled by computing system **40**, which, in some embodiments, may be a personal computer (PC), console, smartphone, tablet, or similar system in wireless communication with microcontroller **15**. System **10** is preferably powered by a power source or battery **16**. The fan **30** may be located internal to the container **12** and disperse scent thorough at least one vent (not shown) in the bottom **14** of the housing **200**.

[0037] The system **10** is activated by a wireless signal that is delivered to microcontroller **15**, which activates the fan **30** and instructs servo **18** to move to a desired position. As the servo **18** moves, it rotates a shaft **122** attached to a spring-loaded base **25** arranged adjacent the bottom side of cartridge housing **200**. Stopper base **25** includes five (5) upwardly mounded plugs or stopping elements **300** that seal the chamber from the scent above, and includes a shaped cutout **28** allowing one scent to be activated and dispersed at a time. Shaft **122** and base **25** preferably rotate in unison.

As shaft **122** rotates, the mounded plugs **300** bias or push the spring-loaded base **25** downwardly until it reaches the desired position. When the servo **18** rotates base **25** to its desired position, the biasing-tension pushes the mounded plugs **300** upwardly into the inactive chambers **20**, thereby sealing them from ambient air, while leaving the active chamber accessible.

[0038] In some embodiments, software hosted on the computing system **40** controls the transmission of signals to the microcontroller **15** determining the ordering and timing of activation of the servo **18** and fan **30**, therefore controlling the ordering and timing of the release of scent from the various chambers **20**. One or more of the chambers **20** in the cartridge housing **200** include a scent cartridge **100** for releasing a specific scent.

[0039] As shown in FIGS. **5** through **10**, a second embodiment of an olfactory simulation system includes a base A, a rotatable cartridge housing B, a microcontroller C, an optional stepdown converter D, a power source or battery E, a servo F for rotating the cartridge housing B with respect to base A, a mount I, and a fan J. The mount I is configured to attach to the front side of a VR/AR headset via conventional means (e.g., adhesive, hook-and-loop style fasteners attached to the system **10** and headset, friction fit, snap fit, etc.) so the scents are dispersed by the invention downwardly toward the user's nose and nasal passages, but the user's nose remains external to the system **410**. Shaft **422** extends from servo F, through cartridge housing B, and engages base A, such that activation of the servo F results in rotation of the cartridge housing B relative to base A. Similar to the first embodiment, software hosted on a computing system (not shown) controls the transmission of signals to the microcontroller C determining the ordering and timing of activation of the servo F and fan J, therefore controlling the ordering and timing of the release of scent from the various chambers **420**.

[0040] Referring now to FIGS. **6**A and **6**B, base A is attached to mount I via conventional means, such as fasteners extending through holes **415** into mount I. Base A is generally circular in shape, including a raised ridge **426** having an overhang **427**. The raised ridge **426** is sized and shaped to receive a portion of cartridge housing B beneath overhang **427**. Base A further includes cutout **428** which creates a gap in the raised ridge **426**. Base A further includes a central bore **432** for receiving shaft **422** attached to servo F. Base A further includes one or more indentions **414**.

[0041] Referring now to FIGS. **7**A and **7**B, cartridge housing B is generally semicircular in shape, and includes a plurality of chambers **420** spaced around the perimeter of the cartridge housing B. The cartridge housing B further includes a cutout **450** shaped to receive at least a portion of servo F, the cutout **450** including a bore **452** for receiving a shaft (not shown) attached to servo F.

[0042] Referring now to FIGS. **7**C, **7**D, and **7**E, the cartridge housing B fits adjacent to the base A and a portion of the perimeter of the cartridge housing B is received by the raised ridge **426**. Cartridge housing B and base A fit such that central bore **432** and bore **452** are aligned. A substantially rectangular frame **454** extends perpendicular to the base A and is sized to accept a fan J.

[0043] Referring now to FIGS. **8**A and **8**B, spring gasket **456** is a flexible structure, in some embodiments made of rubber, which attaches to the cartridge housing B, providing tension between the cartridge housing B and the base A. As shown in FIG. **7**C, spring gasket fits around a portion of cartridge housing B, fitting between cartridge housing B and the raised ridge **426** to form a slidable, substantially airtight seal between the two, preventing scent from escaping.

[0044] Referring now to FIGS. **9**A and **9**B, base gasket **458** is a ring-shaped flexible structure, in some embodiments made of rubber, which attaches to the base A. Base gasket may include one or more protrusions **460** which engage the one or more indentions **414** in base A to maintain the position of the base gasket **458** with respect to the base A. The base gasket **458** further includes a cutout **462** that aligns with the cutout **428** of the base A.

[0045] Referring now to FIG. **10**, rear cartridge housing gasket **464** is a curved, flexible structure shaped like a segment of a ring, in some embodiments made of rubber. Gasket **464** is attached to the rear of cartridge housing B, and fits between cartridge housing B and base gasket **458**, while base gasket **458** fits between gasket **464** and base A. The gaskets **458**, **464** contact each other to form a slidable, substantially airtight seal between the two, preventing scent from escaping. However, when cartridge B and gasket **464** are rotated by servo F such that as chamber **420** aligns with cutouts **428**, **462**, scent from that chamber may escape downwards through the cutout in proximity to fan J for further dispersal.

[0046] The described first and second embodiments of olfactory simulation systems **10**, **410** both include a cartridge housing **200**, B having six chambers **20**, **420**. However, it should be understood that cartridge housings with different numbers of chambers are within the scope of this invention.

[0047] As shown in FIG. **11**, a first exemplary scent cartridge **100** preferably includes a shell **110** made of foam or other deformable material and is activated by the user squeezing the shell **110** and activating (by fracturing or breaking open) a custom scent capsule **120** encased within cartridge **100**. Typically, a cartridge **100** is activated prior to loading the cartridge into a chamber **20**, **420**. The scent capsule contains a scented liquid, gas, or solid. In some embodiments, cartridge **100** further includes cotton-fiber infill material **130** that absorbs the liquid scent once it is freed from capsule **120**. In other embodiments, the infill material **130** is a wax that absorbs or adsorbs the liquid scent once it is freed from the capsule **120**. Capsule **120** can be adjusted to varying strengths by changing the volume or concentration of the liquid scent therein or by other means known in the art. In some embodiments, cartridges **100** include a pull tab **140** on an end of the shell **110** for ease of grasping and removing the cartridge **100** from a chamber **20**, **420**. The cartridges **100** are loaded into the chambers **20**, **420** of cartridge housing **200**, B of the invention described herein, via pull tab **140**. In the cartridge housing **200** of the first embodiment, one chamber **20** is typically left empty to provide a "no smell" or "no scent" condition.

[0048] Referring now to FIG. **12**, a second exemplary scent cartridge **500** includes a generally cylindrical shell H and a cap G. Shell H includes a vented bottom **502**, an open top **504**, and a flange **506**. In preparation for use, a scented solid, such as solid at room temperature wax, is inserted into the shell H. Cap G is then fitted onto the top of shell H, abutting flange **506**, and sealing the scented solid within the shell H. The vented bottom **402** is removably sealed by an impermeable cover, such as adhesive foil. The cartridge **400** can then be transported or stored without appreciable release

of scent. When ready for use, the impermeable cover is removed prior to loading the cartridge **500** into a chamber **20**, **420**. The vented bottom **502** of the cartridge **500** is inserted into the chamber **20**, **420** until the flange **506** contacts the cartridge housing **200**, B, forming a seal. The cartridge **500** remains in the chamber **20**, **420** via a friction fit.

[0049] The cartridges **100**, **500** both possess a long shelf life (preferably greater than 24 mos.) before activation. Once activated, the cartridges **100**, **500** can remain potent/active for several days or several weeks, depending on the scent and whether a liquid or wax-based scented material is used. The scented materials remain within their respective cartridges **100**, **500** and do not come into direct contact with other components of the system **10**, **410**, thereby significantly reducing the potential for residual contamination as compared to known conventional scent delivery systems.

[0050] A suitable application of this technology is as an education appliance and augmentation to systems employing head-mounted displays, although it also has broad commercial appeal in health/healthcare, entertainment, gaming markets, and as a "smart" air refresher device (e.g., Amazon Alexa®-enabled, Google Home®) as well. Conventional scent delivery augmentation systems typically place a user's face in a closed/sealed facemask, and use aerosols dispensed through a hole disposed directly in front of the user's nose to deliver the scent. These systems are unable to effectively accommodate unpleasant or acrid odors, as direct application to a user's nose could be distasteful or even harmful. In addition, aerosols leave residue that may contaminate hardware, particularly if the scent is released into an enclosure and cannot readily diffuse away.

[0051] The disclosed system **10**, **410** of the current invention employs a fan **30**, F to disperse a scent downwards from the front of a headset, so the user's nose is not enclosed with the scent and the scent is not directed onto the headset. This system is, thus, better able to accommodate unpleasant and acrid odors and prevent undesirable residues from contaminating the hardware.

[0052] This system **10**, **410**, is further suitable for training and simulations, therapeutic applications, gaming, static VR experiences, videos/movies/films, and even still images. Other applications include therapeutic applications, such as, for example, simulations that assist combat veterans in better coping with triggers of post-traumatic stress syndrome by combining VR combat experiences with scents of gunpowder. Other applications include training law enforcement personnel to recognize houses where illegal drugs are manufactured by combining VR experiences of exploring a house with the scents of chemicals used to manufacture drugs.

[0053] As a wireless [smart] air refresher device, this system can be programmed to emit a variety of scents at a variety of intervals, with a variety of intensities through voice-activated commands. Thus, complex scent profiles can be loaded and smart home devices (such as those listed previously) can activate scents in different sequences, adjust intensities (by preset fan speeds), and be controlled by conventional methods associated with smart home automation systems.

[0054] The cartridge-based, open design of the present invention leaves the scent exposure to occur and dissipate in ambient air. The novelty of this system is articulated by its universal-fit design that fits all VR and most AR/XR headsets currently on the market by simply attaching to the front of the headset. Moreover, its alternative scent dispersion method does not depend on discharging pressurized aerosol cartridges into a sealed facemask, in relatively close proximity to user's paranasal system. This limits contaminating scents/residue left by undissipated aerosol, allowing for more accurate representation of scent information. The current invention also limits the likelihood of false innervation within paranasal structures, where users might be reacting more to the sudden discharge of a pressurized gas more than the odor itself. Finally, keeping the scent outside of the closed facemask makes the use of unpleasant odors possible, without fear of contamination/residue being left on the apparatus.

[0055] While the novel technology has been illustrated and described in detail in the figures and foregoing description, the same is to be considered as illustrative and not restrictive in character, it being understood that only the preferred embodiments have been shown and described and that all changes and modifications that come within the spirit of the novel technology are desired to be protected. As well, while the novel technology was illustrated using specific examples, theoretical arguments, accounts, and illustrations, these illustrations and the accompanying discussion should by no means be interpreted as limiting the technology. All patents, patent applications, and references to texts, scientific treatises, publications, and the like referenced in this application are incorporated herein by reference in their entirety.

[0056] While this disclosure has been described as having an exemplary design, the present disclosure may be further modified within the spirit and scope of this disclosure. This application is therefore intended to cover any variations, uses, or adaptations of the disclosure using its general principles. Further, this application is intended to cover such departures from the present disclosure as come within known or customary practice in the art to which this disclosure pertains.

1. An olfactory simulation system comprising:

a base including a cutout;

a cartridge housing including a plurality of chambers; and

a servo operatively coupled to the base and the cartridge, the servo configured to rotate one of the base and the cartridge housing with respect to the other of the base and the cartridge housing to align one of the plurality of chambers with the cutout;

wherein each of the plurality of chambers not aligned with the cutout are sealed.

2. The olfactory simulation system of claim **1**, further comprising:

a container including a top, bottom, and at least one side extending between the top and the bottom, the container having an interior; and

wherein the cartridge housing and the base are located within the interior.

3. The olfactory simulation system of claim **2**, wherein the base includes at least one stopping element shaped to at least partially insert into the chamber and substantially seal the chamber.

4. The olfactory simulation system of claim **3**, wherein the base includes a number of stopping elements shaped to substantially seal the plurality of chambers, and wherein the plurality of chambers exceeds the number of stopping elements by one.

5. The olfactory simulation system of claim **1**, further comprising a shaft extending between the servo and the base.

6. The olfactory simulation system of claim **1**, further comprising a microcontroller operatively coupled to the servo.

7. The olfactory simulation system of claim **6**, wherein the microcontroller is configured to receive a signal from a computing system and activate the servo pursuant to the signal.

8. The olfactory simulation system of claim **7**, wherein the computing system is in wireless communication with the microcontroller.

9. The olfactory simulation system of claim **1**, further comprising a fan and a microcontroller operatively coupled to the fan.

10. The olfactory simulation system of claim **9**, wherein the microcontroller is configured to receive a signal from a computing system and activate the fan pursuant to the signal.

11. The olfactory simulation system of claim **9**, further comprising:

a container including a top, bottom, and at least one side extending between the top and the bottom, the container having an interior; and

wherein the cartridge housing, the base, the microcontroller, and the fan are located within the interior.

12. The olfactory simulation system of claim **11**, wherein the container includes at least one vent, and wherein the fan is configured to guide air from the interior through the at least one vent.

13. The olfactory simulation system of claim **11**, wherein the container is spaced apart from a user's nose.

14. The olfactory simulation system of claim **11**, further comprising means for removably attaching the container to a headset.

15. The olfactory simulation system of claim **1**, further comprising a mount configured to removably attach to a headset; and

wherein the base is attached to the mount.

16. The olfactory simulation system of claim **1**, further comprising a gasket positioned between the base and the cartridge housing, the gasket forming a slidable seal between the base and the cartridge housing.

17. The olfactory simulation system of claim **1**, wherein the base includes a raised ridge shaped to receive a portion of the cartridge housing.

18. The olfactory simulation system of claim **1**, further comprising at least one scent cartridge configured to fit within one of the plurality of chambers.

19. The olfactory simulation system of claim **18**, wherein the scent cartridge includes a shell, the shell having a scent capsule and infill material therewithin.

20. The olfactory simulation system of claim **19**, wherein the shell is constructed to be deformable by hand, and wherein the scent capsule is constructed to be fracturable by hand.

21. The olfactory simulation system of claim **19**, wherein the scent capsule contains a scented liquid, gas, or solid.

22. The olfactory simulation system of claim **21**, wherein the scent capsule contains a scented liquid.

23. The olfactory simulation system of claim **19**, wherein the infill material is composed of material to absorb or adsorb the scented liquid.

24. The olfactory simulation system of claim **18**, wherein the scent cartridge includes:

a cylindrical shell for containing a scented material, the shell having an open end and a vented end opposite end the open end, and

a cap for removably sealing the open end.

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