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(71) Applicant: **MICRONEB TECH HOLDINGS, INC.** [US/US]; 7127 1st Ave S, St Petersburg, FL 33707 (US).

(72) Inventors: **ALBERT, Pradeep**; 4199 Losillias Dr, Sarasota, FL 34238 (US). **NICHOLS, Christine**; 12100 Seminole Blvd., Lot 43, Largo, FL 33778 (US). **CONDRON, David, J.**; 8916 Saint Andrews Drive, Seminole, FL 33777 (US). **ARTZE, Brian**; 5948 Bayview Cir S., Gulfport, FL 33707 (US). **SABA, Fadi**; 430 72nd St S, St Petersburg, FL 33707 (US). **KLEIN, Jesse**; 3011 Leanne Court, Clearwater, FL 33759 (US). **VAD, Vijay**; 220 East 65 Street 4C, New York, NY 10065 (US). **NAEGER, Stephen**; 11191 133rd St, Largo, FL 33774 (US). **BEST, Shawn**; 20115 Bay Cedar Ave., Tampa, FL 33647 (US).

(74) Agent: **FAHEY, Derek**; The Plus IP Firm, 101 NE 3rd Ave, Suite 1500, Fort Lauderdale, FL 33301 (US).

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(54) Title: APPARATUS, METHODS, AND SYSTEMS FOR DELIVERY AND ADMINISTRATION OF PHARMACEUTICAL, THERAPEUTIC AND COSMETIC SUBSTANCES TO USERS

(57) Abstract: Apparatus, methods, and systems for delivery and administration of pharmaceutical, therapeutic and cosmetic substances to users. The method includes providing a removable capsule having an atomizer, inserting the removable capsule in a channel of a base unit of a device. The channel is in fluid communication with a mixing chamber of the base unit, and the base unit defines openings on the base unit configured to receive a portion of a conduit and a removable air mover unit. Further, the method includes dispensing, using the atomizer, the at least one medication from the removable capsule to the mixing chamber of the base unit, and using the removable air mover unit, causing air and the at least one medication within the mixing chamber to be conveyed from the mixing chamber to the conduit such that air and the at least one medication dispensed from the removable capsule exits the conduit.

WO 2025/019429 A2

APPARATUS, METHODS, AND SYSTEMS FOR DELIVERY AND ADMINISTRATION OF PHARMACEUTICAL, THERAPEUTIC AND COSMETIC SUBSTANCES TO USERS

INCORPORATION BY REFERENCE

[0001] This application claims the benefit of PCT/US24/33131 and filed June 07, 2024, which claims the benefit of U.S. Non-Provisional Application Serial No. 18/207,242 titled "Apparatus, Methods, and Systems for Administering a Medication to a Patient" and filed June 8, 2023, the subject matter of each of which is incorporated herein by reference.

[0002] This application also claims the benefit of U.S. Non-Provisional Patent Appl. No. 18/654,471 titled "Methods and Systems for Delivering Formulations to Users Using Modular Device Having Removable Cartridge" and filed May 3, 2024 which is a continuation in part application of U.S. Non-Provisional Application Serial No. 18/529,978 titled "Apparatus, Methods, and Systems for Providing Pharmaceutical Compositions and Administering Medications to Patients" and filed December 05, 2023, which claims the benefit of U.S. Provisional Application Serial No. 63/437,568 titled "Compositions, Methods, and Systems for Providing a Nebulized Solution" and filed January 6, 2023.

[0003] This application also claims the benefit of U.S. Non-Provisional Application Serial No. 18/630,093 titled "Apparatus, Methods, and Systems for Delivery and Administration of Pharmaceutical, Therapeutic, and Cosmetic Substances to Users" and filed April 9, 2024, which is a continuation in part application of U.S. Non-Provisional Application Serial No. 18/529,978 titled "Apparatus, Methods, and Systems for Providing Pharmaceutical Compositions and Administering Medications to Patients" and filed December 05, 2023, which claims the benefit of U.S. Provisional Application Serial No. 63/437,568 titled "Compositions, Methods, and Systems for Providing a Nebulized Solution" and filed January 6, 2023.

[0004] The U.S. Non-Provisional Application Serial No. 18/529,978 is also a continuation in part application of U.S. Non-Provisional Application Serial No. 18/373142 titled "Apparatus, Methods, and Systems for Administering a Medication to an Animal" and filed September 16, 2023, which is a continuation in part application of U.S. Non-Provisional Application Serial No. 18/449,838 titled "Apparatus, Methods, and Systems for Administering a Medication to a Patient" and filed August 15, 2023, which is a continuation in part application of U.S. Non-Provisional Application Serial No. 18/224,502 titled "Apparatus, Methods, and Systems for Administering a Medication to a Patient" and filed July 20, 2023, which is a continuation in part application of U.S. Non-Provisional

Application Serial No. 18/207,242 titled "Apparatus, Methods, and Systems for Administering a Medication to a Patient" and filed June 8, 2023, the subject matter of each of which is incorporated herein by reference.

[0005] The priority and subject matter of each of the related applications is claimed and incorporated herein by reference. This incorporation includes all the associated embodiments, descriptions, and claims detailed in the referenced applications as is fully recited herein.

TECHNICAL FIELD

[0006] The present disclosure relates to the field of mesh nebulizers, and more specifically to the field of mesh nebulizers for administering medications.

BACKGROUND OF THE INVENTION

[0007] A mesh nebulizer, also known as a vibrating mesh nebulizer, is a type of device used to deliver medication in a fine mist or aerosol form, which makes it easier for patients to inhale the medication directly into their lungs. This is particularly useful for the treatment of respiratory diseases like asthma, COPD (chronic obstructive pulmonary disease), or cystic fibrosis. The "mesh" in the name refers to a key component of the nebulizer: a small plate with multiple tiny holes, or a "mesh". This mesh vibrates at high frequencies, causing the liquid medication to be pushed through the tiny holes in the mesh, creating a fine mist or aerosol that can be inhaled. Mesh nebulizers are generally more efficient and portable than traditional jet nebulizers. They tend to be quiet, lightweight, and capable of nebulizing a wide range of medications. However, they can be more expensive, and the mesh plate can become blocked over time, requiring replacement. Proper cleaning and maintenance are important to keep the device functioning properly.

[0008] Inhalers are another form of medical devices that are used to deliver medication directly into the lungs. They are commonly used to treat conditions like asthma and chronic obstructive pulmonary disease (COPD). There are two main types of inhalers: metered-dose inhalers (MDIs) and dry powder inhalers (DPIs). MDIs use a chemical propellant to push the medication out of the inhaler. The user pushes down on the top of the inhaler and inhales at the same time to ensure the medication reaches the lungs. MDIs also can be used with a spacer, a tube-like device which provides a space for the medication to mix with air

before reaching the lungs. This makes it easier for the medication to be inhaled and is especially helpful for children or people who have difficulty coordinating their breath with the release of the medication. DPIs do not use a chemical propellant. Instead, the medication is in a powder form, which the user inhales. Because they require a strong, quick inhalation to get the medication into the lungs, DPIs can be harder for some people to use than MDIs. Inhalers can deliver a variety of medications. However, the effectiveness of inhalers depends significantly on correct usage. Mistakes in technique can result in less medication reaching the lungs. These mistakes could include breathing too quickly or not deeply enough, not shaking the inhaler before use, or not using a spacer if needed. Some inhalers, especially newer or brand-name inhalers, can be quite expensive, potentially posing a financial burden.

[0009] Despite the various advancements in the field of medication delivery via capsules, there exist several challenges that continue to impact both patient compliance and the overall effectiveness of the treatment. One major challenge is the management of precise dosage control. In many instances, the ability to ensure a patient receives the exact dose of medication prescribed is crucial for the treatment's efficacy. However, it is a common problem that current capsule systems might not always deliver the accurate dose due to the limitations in the mechanism of action or variability in user technique. Further, many capsule systems for medication delivery require intricate instructions for use, which can lead to user errors. This is particularly relevant in instances where capsules need to be loaded into a device, such as an inhaler, where improper loading could result in suboptimal medication delivery. User-friendliness and ease of use are paramount in designing such systems, and any complexity can lead to misuse or non-compliance.

[0010] The potential for contamination is another issue that is often encountered in these systems. This can occur during the loading of the capsule into the delivery device or during the process of administering the medication itself. Both scenarios can compromise the sterility of the medication, leading to potential health risks. Another concern with these systems is the difficulty of integrating modern technologies such as sensors and connectivity features. The inclusion of these technologies could enhance the performance and functionality of the capsule systems by enabling real-time monitoring, improving dosage control, or allowing for personalized treatments. However, the integration of such

features in a compact and user-friendly form remains a significant challenge. Regarding the specific use of medicine vials, while their adoption has provided a convenient way to store and administer liquid medication, issues arise in terms of potential wastage and the need for preservatives. Many vials are single-use to maintain sterility, but this can lead to medication wastage if the full vial content is not used. Additionally, the need for preservatives in multi-dose vials to prevent microbial contamination can lead to potential allergic reactions or side effects.

[0011] A common challenge observed in prior art pertaining to medication delivery via capsules revolves around the lack of interchangeability. A significant number of the pre-existing capsule systems are designed for a specific medication or a particular type of medication. This can be due to the unique physical or chemical properties of the medication, such as particle size in case of inhaled medication, or stability considerations for certain biologics. The lack of a standardized, universal system restricts the ability to switch between different medications using the same delivery device, limiting the versatility of the treatment options. Moreover, the ease of transportation is another aspect that remains wanting in many prior art capsule systems. Certain systems, particularly those requiring intricate loading or handling procedures, can prove cumbersome to transport, and potentially fragile. This is a critical consideration for patients who need to carry their medication for use throughout the day, or during travel. Ideally, medication delivery systems should be robust, compact, and portable, making them convenient for users to carry and use as required. Non-invasive administration of medication is an essential aspect of patient compliance and comfort. In the prior art, many delivery systems, particularly for certain conditions, might require invasive procedures such as injections, which can cause discomfort or distress to patients. These methods also raise potential issues of sterility and can increase the risk of infection. Therefore, there is a persistent need for delivery systems that can efficiently administer medication in a non-invasive manner, such as inhalation or oral administration, without compromising on the medication's efficacy.

[0012] Referring to compositions, methods, and systems for treating opioid dependency and opioid overdose, opioid dependency is a chronic condition characterized by a physical and psychological reliance on opioids. This dependency often arises from prolonged opioid use, whether for medical or non-medical reasons. The treatment of opioid dependency is

complex, involving a gradual weaning process to mitigate withdrawal symptoms and reduce reliance on the drug. Effective management of opioid dependency requires a carefully calibrated approach to medication, often necessitating tailored dosages and controlled administration to support gradual reduction in opioid use.

[0013] In contrast, opioid overdose presents an acute emergency scenario. Overdosing on opioids can lead to critical symptoms such as respiratory depression, unconsciousness, and, in severe cases, death. Rapid intervention is crucial in these situations. Medications such as naloxone have been developed to counteract the life-threatening effects of an opioid overdose. The swift administration of such medications can reverse the overdose symptoms, making speed and efficiency in drug delivery systems critical for successful emergency response.

[0014] Both these aspects – the chronic management of opioid dependency and the acute response to opioid overdose – highlight the need for versatile and effective pharmaceutical solutions. These solutions must be adaptable to different scenarios, ranging from controlled, gradual dosage for dependency treatment to rapid, emergency administration for overdoses. The development of such treatments and delivery systems is central to addressing the complexities and urgent needs posed by the opioid crisis.

[0015] Naloxone is a critical drug in the fight against opioid overdose. As an opioid antagonist, it rapidly reverses the effects of opioid overdose, including respiratory depression, sedation, and hypotension, by displacing opioids from receptor sites in the brain. Its life-saving capabilities have been recognized globally, with its use in emergency settings being pivotal for immediate response to opioid overdoses. For broader accessibility, especially in non-medical environments, naloxone is also formulated for intramuscular or subcutaneous injection, frequently deployed using auto-injectors. Furthermore, nasal spray formulations of naloxone have gained prominence due to their needle-free, user-friendly nature, significantly enhancing public health responses to opioid overdoses.

[0016] A pressing issue in contemporary public health is the increasing incidence of Xylazine, traditionally a veterinary sedative, being ingested by humans, often unknowingly, through its incorporation into street drugs. Xylazine, not approved for human use, poses significant health risks when consumed by humans, leading to profound

sedation, respiratory depression, and other severe side effects. The contamination of street drugs with Xylazine has become a dangerous trend, contributing to a rise in drug-related emergencies and complications. This emerging problem highlights an urgent need for effective measures to counteract the effects of Xylazine in humans. While Naloxone, commonly used to reverse opioid overdose, is ineffective against Xylazine, the potential role of Yohimbine, an alpha-2 adrenergic receptor antagonist, comes into focus. Given Yohimbine's efficacy in reversing Xylazine's effects in veterinary contexts, there is a growing interest in exploring its applicability for similar use in humans. The development of a safe and effective antidote or treatment protocol involving Yohimbine could be pivotal in addressing the complications arising from Xylazine ingestion in humans. This situation underscores the need for rapid response from the medical community and drug regulatory authorities to mitigate this emerging public health concern. Tolazoline, a vasodilator and an alpha-adrenergic antagonist, is known for reversing the effects of sedatives and for its use in various medical applications. Its potential contribution to opioid overdose treatment is intriguing, given its pharmacological profile, which could complement the actions of other agents in managing the effects of opioid toxicity. Tolazoline is typically administered intravenously, especially in hospital environments for diagnosing vascular disorders and treating skin ulcers. In neonatal care, particularly in veterinary medicine, tolazoline is used intravenously to reverse sedative effects in neonates.

[0017] Albuterol, primarily known for treating bronchospasm in conditions like asthma and chronic obstructive pulmonary disease, works by relaxing the muscles in the airways and increasing airflow to the lungs. Albuterol is most effectively delivered through inhalation using metered-dose inhalers or nebulizers. This method ensures direct lung delivery, providing swift symptom relief. Additionally, albuterol is available in oral forms, including tablets and liquid preparations, though these are less common compared to inhalation routes. In severe cases, intravenous administration of albuterol may be warranted, albeit in a strictly monitored hospital setting.

[0018] Each of these active ingredients has a unique profile and mechanism of action, making them valuable in addressing various aspects of opioid overdose and dependency. However, the inherent limitations in prior art related to interchangeability, transportability, and non-invasive administration pose significant barriers to optimal patient care. The need

for more adaptable, easily transportable, and less invasive delivery systems persists, driving the continuous pursuit for innovation in this field. As a result, there exists a need for improvements over the prior art and more particularly for improved, user-friendly, and reliable capsule systems and pharmaceutical compositions that can provide accurate dosing, maintain sterility, and integrate modern technologies for enhanced monitoring and control.

BRIEF SUMMARY OF THE INVENTION

[0019] An apparatus, method, and system for administering at least one substance to a to a subject is disclosed. This Summary is provided to introduce a selection of disclosed concepts in a simplified form that are further described below in the Detailed Description including the drawings provided. This Summary is not intended to identify key features or essential features of the claimed subject matter. Nor is this Summary intended to be used to limit the claimed subject matter's scope.

[0020] In one embodiment, the method involves providing a removable capsule having an atomizer, and inserting the removable capsule in a channel of a base unit of a device. The channel is in fluid communication with a mixing chamber of the base unit, and the base unit defines openings on the base unit configured to receive a portion of a conduit and a removable air mover unit. The removable air mover unit is electrically connected directly to the base unit. Further, the method includes dispensing, using the atomizer, the at least one substance from the removable capsule to the mixing chamber of the base unit. In the mixing chamber, the at least one substance is combined with air. The method includes using the removable air mover unit, causing air and the at least one medication within the mixing chamber to be conveyed from the mixing chamber to the conduit such that air and the at least one substance dispensed from the removable capsule exits the conduit.

[0021] In one embodiment, a system for administering at least one substance to a body part of a user is disclosed. The system comprises a removable capsule comprising the at least one substance wherein the at least one substance is a biological agent, and an atomizer disposed directly adjacent to a capsule chamber of the removable capsule, wherein the at least one medication contacts the atomizer within the capsule chamber. The system includes a base unit of a device comprising a mixing chamber and a plurality of openings

in fluid communication with the mixing chamber, and a removable air mover unit attached to the base unit of the device via an opening of the said plurality of openings on the base unit, wherein an outward surface of the removable air mover unit abuts an inner wall of the opening that receives the removable air mover unit. The removable air mover unit is in fluid communication with the mixing chamber of the base unit, the removable air mover unit is configured such that air conveyed from the removable air mover unit moves into the mixing chamber, and the removable air mover unit is in direct electrical connection with the base unit of the device and a first electrical contact is disposed on the outward surface of the removable air mover unit and a second electrical contact is disposed on the inner wall of the opening of the base unit for providing electrical communication between the removable air mover unit and the base unit. Further, the system includes a conduit connected to the base unit and in fluid communication with mixing chamber, the conduit configured to convey the at least substance to the body part of the user

[0022] Additional aspects of the disclosed embodiment will be set forth in part in the description which follows, and in part will be obvious from the description, or may be learned by practice of the disclosed embodiments. The aspects of the disclosed embodiments will be realized and attained by means of the elements and combinations particularly pointed out in the appended claims. It is to be understood that both the foregoing general description and the following detailed description are exemplary and explanatory only and are not restrictive of the disclosed embodiments, as claimed.

BRIEF DESCRIPTION OF THE DRAWINGS

[0023] The accompanying drawings, which are incorporated in and constitute part of this specification, illustrate embodiments of the disclosure and together with the description, explain the principles of the disclosed embodiments. The embodiments illustrated herein are presently preferred, it being understood, however, that the disclosure is not limited to the precise arrangements and instrumentalities shown, wherein:

[0024] FIG. 1 illustrates the device for administering at least one medication to a patient in an unconscious state to a conscious state, according to a wand embodiment.

[0025] FIG. 2 illustrates the device for administering at least one medication to a patient in an unconscious state to a conscious state, according to the wand embodiment.

[0026]

[0027] FIG. 3A is a perspective side view of the wand embodiment of the medical device, according to an example embodiment;

[0028] FIG. 3B is a side view of the wand embodiment of the medical device, according to an example embodiment;

[0029] FIG. 3C is a perspective side view of the wand embodiment of the medical device, according to an example embodiment.

[0030] FIG. 3D is a perspective side view of a wand embodiment of the medical device having a removable air mover unit, according to another example embodiment.

[0031] FIG. 3E is a schematic view of an opening of a device and an air mover unit, according to another example embodiment.

[0032] FIG. 3F illustrate schematic view of operation of a device for delivering medication, according to another example embodiment.

[0033] FIGS. 3G, and 3H, illustrate a removable cap and a resilient bladder attached to a base unit of a device, according to another example embodiment.

[0034] FIGS. 3I, 3J and 3K illustrate various additional components attached to a base unit of a device, according to another example embodiment.

[0035] FIG. 3L is a flowchart diagram illustrating steps for a method for using the removable air mover unit, according to an example embodiment.

[0036] FIG. 3M is a flowchart diagram illustrating steps for a method for administering medication to a user from a capped chamber, according to an example embodiment.

[0037] FIG. 3N illustrates a skin care cup and an elongated tube attached to a base unit of a device, according to another example embodiment.

[0038] Like reference numerals refer to like parts throughout the various views of the drawings. FIGS. 1 through 1N are drawn to scale.

DETAILED DESCRIPTION

[0039] The following detailed description refers to the accompanying drawings. Whenever possible, the same reference numbers are used in the drawings and the following

description to refer to the same or similar elements. While disclosed embodiments may be described, modifications, adaptations, and other implementations are possible. For example, substitutions, additions, or modifications may be made to the elements illustrated in the drawings, and the methods described herein may be modified by substituting reordering or adding additional stages or components to the disclosed methods and devices. Accordingly, the following detailed description does not limit the disclosed embodiments. Instead, the proper scope of the disclosed embodiments is defined by the appended claims.

[0040] The disclosed embodiments improve upon the problems with the prior art by providing a compact air mover unit that can be attached to the device. An air mover unit attached to a medical inhalation device optimizes the delivery mechanism of inhaled medication, enhancing the efficiency and effectiveness of the treatment process. The air mover unit creates a controlled flow of air to propel a mixture of medication toward the patient. This action ensures that the medication is delivered directly to the user's respiratory system in an optimal aerosolized form. Further, the incorporation of an air mover unit improves the consistency of dose delivery, enhancing the user's ability to receive the full therapeutic benefit of the medication, and reducing the physical effort required by the patient to inhale the medication, thereby improving the overall effectiveness of treatments.

[0041] Further, the disclosed embodiments provide the air mover unit with electrical contacts that can be easily connected to the device by enabling a quick and efficient electrical connection between the air mover unit and the device. This feature facilitates the immediate activation and control of the air mover unit upon attachment, streamlining the setup process and enhancing the device's overall usability. The design of the electrical contacts ensures a secure and reliable connection, providing for consistent operation of the air mover unit. Additionally, the disclosed embodiments improve over the prior art by providing the air mover unit that propels the mixture of medication through long flexible tubes, even those with multiple turns, without accumulating medications in the turns. This maintains a consistent and controlled airflow that ensures the aerosolized substance is delivered efficiently and uniformly. The air mover unit generates a flow of air to navigate the complexities of a tube's interior, including its length and any bends. Further, the air mover unit prevents the sedimentation of medication particles at the curves or turns of the tubing providing a seamless delivery.

[0042] The system also improves over the prior art by providing a device capable of receiving various modular attachments for medication, therapeutic and cosmetic purposes thereby offering a customizable and multifunctional tool that can cater to a wide range of user needs. This modular capability allows for the seamless interchange of attachments designed for specific treatments, enabling the device to administer a variety of medicated aerosols for respiratory conditions and deliver substances for cosmetic applications, such as moisturizers or treatments for skin conditions, through the same system. The system's ability to deliver and administer a diverse range of substances other than pharmaceuticals, including therapeutic and cosmetic substances, offers a significant advantage by broadening its applicability across various industries and use cases. Such a system provides users with a more comprehensive care solution, accommodating a wide array of health, wellness, and beauty needs through a single, innovative device. By catering to this broader spectrum of applications, the system stands out as a multifunctional tool that can deliver targeted treatments ranging from medical therapies to skincare routines, thereby meeting a wider range of consumer demands and expectations.

[0043] The disclosed embodiments improve over the prior art by providing a device to deliver exosomes as medication to users. The use of exosomes, which are vesicles derived from cells that can encapsulate and deliver therapeutic agents directly to specific cells or tissues, provide targeted therapy. The system increases the precision with which medications are delivered, minimizing off-target effects and enhancing the efficacy of treatments. Exosomes can carry a wide range of therapeutic agents, including drugs, RNA, or proteins, directly to diseased cells while sparing healthy tissues. This targeted delivery improves treatment outcomes and reduces the side effects and toxicity associated with conventional therapies.

[0044] The system also improves over the prior art because the medication is held in capsules that includes an atomizer that abuts the medication. Gravity forces the medication to be pressed against the medication to allow for efficient atomization. The capsule is compatible with the attachment because both include electrical contacts that, when paired up, provide electrical communication between the capsule and the attachment.

[0045] The disclosed system and methods described herein represents a significant improvement over prior art by incorporating a sophisticated capsule system for

administering atomized medication. Specifically, the system comprises at least one chamber housing the medication, an atomizer to convert the medication into a fine mist, and various additional components such as sensors and electrical contacts. This design allows for a more controlled and precise delivery of medication, enabling targeted treatment with reduced risk of overdose or underdose.

[0046] In the general practice of medicine for humans, the disclosed invention offers significant improvements over prior art, particularly addressing concerns around modularity, interchangeability, and speed in administration. Modularity enables customization of medical devices to suit individual patient needs and particular medical conditions, allowing for a more targeted and efficient approach. With the invention's design, various components can be added or removed with ease, thereby adapting the device to different scenarios and patient requirements. The interchangeability feature ensures that parts can be substituted without compromising the integrity or functionality of the device, thus increasing its utility and flexibility. This adaptability not only reduces costs by allowing components to be reused across different applications but also facilitates quick adjustments in emergency situations. Finally, the invention's design emphasizes rapid administration of medication, significantly reducing the time required to prepare and deliver treatments. This is particularly crucial in critical care situations, where every second can make a difference in patient outcomes. By addressing these key areas, the invention enhances the efficiency, adaptability, and responsiveness of medical treatment, setting a new standard in patient care.

[0047] Referring now to FIGS. 1, 2, 3A through 3N, views of a wand embodiment of the device 2600 for administering medication to a patient are shown. FIG. 1 is a partial cross-sectional side view of the wand embodiment. FIG. 2 is a perspective view of the wand embodiment. FIGS. 3A through 3N show additional embodiments of the wand. The device 2600 includes a handle 2605 configured to be held a user to administer medication to a patient. The device 2600 includes a pivoting and/or rotating element 2610 configured to alter the angle between the handle and a mouthpiece. The rotating element may be a button to engage a locking mechanism to allow the handle 2605 to change position or relative angle. The rotating element allows the device to rotate and/or pivot about origin 2615. The handle may have at least 180 degrees of rotation – or at least 90 degrees or rotation from

the position shown in Fig. 26 where the device is centered about axis 2617 and may rotate in any such direction toward axis 2619. This may allow the user to better visualize the display on the device.

[0048] The mouthpiece 2616 is in fluid communication with the first channel 2620 and second channel 2625 that are configured to guide the flow of atomized medication from the capsule 2630. In some embodiments, as shown in FIG. 2, the device 2600 may be able to rotate about axis 2634 to reorient the mouthpiece direction relative to axis 2635. In one embodiment, the upper portion of the device may rotate, whereas in another embodiment, the lower portion of the device, namely, the handle, may rotate in the manner indicated by the arrows in FIG. 2. The rotation about axis 2634 may best be described as a twist or rotational motion. The rotation motion allows the administrator of the medication to view the display on the device and/or have access to the controls. For example, if the user is self-administering the atomized medication, the user may want visualization of the screen while they are using the mouthpiece, as shown in FIG. 3C. Similarly, if a third party is administering the device to another, maybe a child or unconscious person for example, then the administrator would want to visualize the screen or display 2640 on the device such that it opposed and/or faced away from the position of the mouthpiece and/or mask. It is understood that the device may have at least 180 degrees of rotation to allow the orientation of the display to align on the same side as the mouthpiece and or oppose the mouthpiece, as necessary. It is understood that FIG. 1 illustrates a first type of rotation, namely, rotating about an origin or pivoting, and FIG. 2 illustrates a second type of rotation, namely, rotating about an axis.

[0049] In an embodiment, as illustrated in FIGS. 3D and 3F, a system for administering substance to a body part of the user is disclosed. The system comprises a wand embodiment of the device 3600 for delivering substance to the user. It is noted that the substance may be one of pharmaceutical, therapeutic, or cosmetic substances, to address specific conditions or enhance skin health. For example, pharmaceutical substances may include a medication, such as antibiotics or antifungal solutions designed to treat infections. In some embodiments, the medication may also include therapeutic substances including a regenerative medication targeting treatment of tissue repair and regeneration in the user. Regenerative medications include bioactive agents or biological agents capable of

stimulating cellular growth, differentiation, and repair. The medication may comprise a combination of growth factors, cytokines, stem cells, or other agents known to facilitate tissue regeneration and repair. In another embodiment, the medication comprises one of peptides, proteins, growth factors, cytokines, exosomes, and extracellular vesicles derived from human mesenchymal stem cells suspended and/or dissolved in an aqueous medium. In another embodiment, the medication is an aqueous suspension and solution comprising cells, cellular byproducts, and cell-derived products. The cells, the cellular byproducts, and cell-derived products are stem cells. It is noted that bioactive agent and biological agent may be used interchangeably throughout the document, as the biological agent may have a bioactive effect in some embodiments. Cosmetic substances may include hyaluronic acid or vitamin C serums for skin rejuvenation. The device atomizes and delivers these substances in a fine mist form to achieve targeted treatment or skincare benefits.

[0050] As noted above, the device 3600 includes a handle 2605 configured to be held by a user to administer medication to the user. In an embodiment, the device 3600 includes a pivoting and/or rotating element configured to alter the angle between the handle 2605 on a lower portion 3609 of the device and a conduit on an upper portion 3607 of the device, such as the conduit 3603. It is noted that the term "user" comprises, but is not limited to, a human being, an animal, or a patient, among other possible entities.

[0051] The device has a highly adaptable head unit or top, such as the upper portion 3607 designed to rotate by complete 360^0 (degrees), providing flexibility in its application. The rotational capability allows the device to be easily adjusted to accommodate various configurations, during use of the device. For example, for direct application in a specific orientation or adjusting the angle to reach different areas effectively, the rotating head unit can have different configurations. In another example embodiment, the design of the device facilitates use by both individual users and others, such as healthcare professionals or caregivers, by simply changing the configuration of the head unit. For a single user, the device can be self-directed to the desired position, ensuring ease of use and convenience. Conversely, when used by another person, such as a health professional or a nurse, the head unit can be adjusted to provide optimal access to the area being treated or worked on, thereby improving the effectiveness and comfort of the application. The device provides

dual-use capability, enabled by the adjustable head unit in both personal and professional settings.

[0052] As shown in FIGS. 3D through 3K, and 3N, the conduit 3603 is attached to the base unit of the device by inserting within the opening 3634. The conduit is primarily cylindrical in shape but can also be designed in various other forms to suit different applications. Examples of alternative shapes include flexible, coiled, or even segmented designs to enhance maneuverability and access to difficult to reach areas. The conduit facilitates the easy attachment of a range of additional components, such as an ocular tube for eye treatments, a spraying catheter for precise delivery of substances, a mouthpiece for inhalation therapies, and the elongated tubes as depicted in FIGS. 3I, 3F, and 3N, respectively. These attachments expand the device's functionality, enabling it to serve a wide array of medical and cosmetic purposes. In various embodiments, the conduit itself can be directly utilized for delivering therapeutic or cosmetic substances to an affected skin area or for enabling substances to be inhaled by the user, showcasing its adaptability in the administration of treatment across different modalities and conditions as outlined in the disclosed embodiments of the specification. The conduit's design allows it to cover specific areas of the skin for targeted substance delivery, that can treat various conditions. This feature is particularly beneficial for administering treatments directly to areas affected by skin burns, where precise application of therapeutic substances can significantly aid the healing process. Additionally, the versatility of the conduit extends to applications involving the external and internal vaginal areas, offering a non-invasive means to deliver treatments for conditions affecting these sensitive regions. By conforming closely to the contours of the targeted area, the conduit ensures that the therapeutic or cosmetic substances are applied efficiently and effectively, maximizing the substance's contact with the skin or mucosal surfaces for optimal absorption and therapeutic effect.

[0053] The system comprises a removable capsule 3610 comprising a medication. In one example, the medication is exosomes. The removable capsule enhances both the functionality and user experience of the device. The removable capsule allows for easy replenishment of medication without needing to replace or service the entire device, facilitating continuous and flexible treatment management for users. This feature is particularly beneficial for individuals requiring regular doses of medication, as it enables

them to conveniently carry and use the device on-the-go, ensuring timely medication administration. Moreover, the removable nature of the capsule permits the cleaning and maintenance of the device components separately, thereby improving hygiene and reducing the risk of contamination. Additionally, the removable capsule provides the flexibility to switch between different types of medications, dosages or any other liquid material. Exosomes are naturally occurring extracellular vesicles released by most cell types, and are used in therapeutic applications, in drug delivery and regenerative medicine. In the context of medication, exosomes can carry therapeutic agents, offering a targeted approach to treatment with reduced risk of adverse side effects. The utilization of a portable device for delivering exosome-based medications offers distinct advantages by enabling precise, controlled dosing and improving patient compliance through ease of use. Such devices can be designed to administer doses at specific times or in response to physiological signals, enhancing the efficacy of treatment regimens. In the disclosed embodiment, the removable capsule contains the medication, however other embodiments disclosing a vial for containing substances other than medication, such as therapeutic and cosmetic substances are also covered within the spirit and scope of the invention.

[0054] The removable capsule has an atomizer disposed directly adjacent to a capsule chamber of the removable capsule. As shown in FIG. 3F, the removable capsule 3610 has the atomizer 3626 and the medication 3628 within the capsule chamber 3620. The atomizer is disposed such that the medication contacts the atomizer within the capsule chamber. In an example embodiment, the atomizer is disposed at a bottom portion of the removable capsule such that when the removable capsule is inserted in the device, the medication is in contact with the atomizer. The atomizer is positioned within the bottom portion of the removable capsule, ensuring that regardless of the capsule's orientation upon insertion into the device, the medication or any other substance within remains in consistent contact with the atomizer. This design ensures optimal utilization of the substance, as the atomizer can effectively convert the medication into a fine mist or aerosol for precise delivery, without the need for the capsule to be in a specific position. The positioning of the atomizer at the bottom portion of the capsule maximizes the effectiveness of the atomization process, ensuring that the entirety of the substance is readily available for conversion and delivery, thereby reducing waste and improving the overall delivery mechanism.

[0055] The device has a base unit 3622 including a mixing chamber 3624 and multiple openings 3634 and 3637 in fluid communication with the mixing chamber 3624. In the mixing chamber, multiple substances are combined or processed to obtain a mixture. For example, the atomized medication particles 3630 is combined with air molecules 3632 in the mixing chamber. Surrounding this mixing chamber, the base unit is equipped with the multiple openings. These openings are designed to facilitate fluid communication with the mixing chamber. This means that they allow for the passage of fluids into and out of the mixing chamber, enabling efficient mixing of materials, the introduction of new substances into the chamber, and the extraction of the resultant mixture, thereby supporting the device's intended functions. As shown in FIG. 3F, the mixing chamber 3624 receives the atomized medication particles 3630 and the air molecules 3632 for mixing and provide the mixture in form of a mist of medication. After the mixing, this mixture is then directed towards the user through the opening 3634, subsequently passing through the conduit 3603, to ensure efficient delivery. The mixing in the mixing chamber transforms the atomized medication and air particles into a homogenized mist, that can be readily inhaled by the user.

[0056] A removable air mover unit 3606 is attached to the base unit of the device via an opening 3608 of the plurality of openings on the base unit, such that such that a central axis of the removable air mover unit aligns with a central axis of the portion of the conduit. In the described embodiment, the air mover unit comprises a fan component and a frame component, with the fan securely nestled within the frame. The configuration optimizes airflow and ensures structural integrity. The air mover unit is further characterized by an outward surface 3611 to engage seamlessly with the inner wall 3604 of the opening of the device when attached. This precise interface between the air mover unit and the device ensures a tight and efficient connection, enhancing the unit's performance by minimizing air leakage and maximizing the directed airflow into the device. The air mover unit is attached to the base unit such that the outward surface 3611 of the removable air mover unit abuts the inner wall 3604 of the opening 3608 that receives the removable air mover unit. In an example, when the removable air mover unit is attached to the base unit, the air mover unit is in fluid communication with the mixing chamber of the base unit, the

removable air mover unit is configured such that air conveyed from the removable air mover unit moves into the mixing chamber.

[0057] The air mover unit is small, compact, and designed to fit within the opening 3608 of the device's base unit. The depicted design of the air mover unit is rectangular, as shown in the figure. It is noted that different shapes and size of the air mover unit including circle or elliptical shape are covered within the spirit and scope of the invention. Further, the air mover unit is positioned within the base unit such that a fan component of the air mover unit specifically configured to direct airflow towards the base unit, thereby optimizing the device's performance through efficient air circulation.

[0058] In an embodiment, the air mover unit is a compact device equipped with an on-board battery, on-board circuitry, including a printed circuit board (PCB), and a Bluetooth connectivity module, making it a standalone, versatile tool for air circulation tasks. Once the air mover unit comes into contact with the base unit, electrical communication is established between them. This connection enables the base unit to power the air mover unit, activating its operational state. In one example, the Bluetooth connectivity module may establish a Bluetooth connection with a compatible controller of a user device, such as a smartphone or tablet. The user can then control activation or deactivation the air mover unit without needing to physically interact with the device. Additionally, the Bluetooth connectivity module allows for remote operation control and monitoring, enhancing the unit's functionality and user convenience. For example, the Bluetooth connectivity module may allow control of fan speed or direction via the user device. The Bluetooth connectivity module also detects the presence or attachment of the air mover unit to the base unit based on Bluetooth signals. Upon recognizing the air mover unit's proximity or connection, the module initiates an activation sequence through electrical communication between the air mover unit and the base unit. This seamless interaction ensures that the air mover unit is promptly activated and ready for operation, leveraging the wireless signals for recognition and efficient power management, thus enhancing the system's usability and performance.

[0059] The removable air mover unit is in direct electrical connection with the base unit of the device. A first electrical contact 3613 is disposed on the outward surface of the removable air mover unit and a second electrical contact 3614 is disposed on the inner wall of the opening of the base unit for providing electrical communication between the

removable air mover unit and the base unit, shown in FIG. 3E. The electrical contacts establish a reliable electrical connection between two the base unit and the air mover unit in form of a cordless power connection. Examples of the electrical contacts include spring-loaded pins offering consistent contact force, blade and receptacle contacts, and leaf spring contacts. These contacts are widely used in battery connections, modular electronic devices, and connectors, for secure and repeatable electrical connection between the two devices.

[0060] In another embodiment, the air mover unit is equipped with an electrical power cord, designed to connect with a corresponding plug on the base unit. This configuration allows for the battery of the base unit to be electrically connected with the air mover unit. The electrical power cord provides device's connectivity and power supply. The cord allows the air mover unit to draw power from the battery of the device, ensuring it operates efficiently and consistently. In an example, the plug point is located on the back of the device, to provide a convenient and unobtrusive way to connect the power cord. The connection of the power cord of the air mover unit to the back of the device provides safety by reducing risk of accidental disconnections. Upon establishing this connection, the battery facilitates the activation of the air mover unit, powering it to function as intended. This design ensures that the air mover unit can be easily integrated into the system, providing a direct power source that enhances its operational efficiency and reliability.

[0061] In another embodiment, the air mover unit has a one-way valve such that in an assembled state, the on-way valve is positioned on the back of the device, for application in dental settings. This valve is used for preventing backflow, ensuring that if the user coughs or gags during a procedure, there is no reverse movement of air or fluids back into the device. The one-way valve maintains the hygiene and integrity of the air mover unit and also safeguards the user from potential cross-contamination. Such a configuration of the device having the one-way valve optimizes the device's safety and hygiene.

[0062] In an example, the airflow from the air mover unit is directed such that the mist, formed by the mixing of atomized medication and air in the mixing chamber, is channeled directly towards the opening 3634. From there, it is guided to exit through conduit 3603, as shown in FIG. 3F for delivery of the medicated mist to the user. The direction of airflow optimizes the delivery mechanism for the mist reaches the user in an effective and

controlled manner. This specific airflow directionality enhances the efficiency of the medication delivery process providing a more effective solution for administering atomized medication. In an example, the air mover unit can be a fan such as an axial fan, a centrifugal fan or a blower, an exhaust fan, a crossflow fan, or a compressor. The integration of the air mover unit within the device offers a more compact, efficient, and effective solution for managing airflow, thereby enhancing the overall performance and user experience of the device.

[0063] It is noted that the air mover unit is shown to be positioned within the opening of the base unit, however in other embodiments, various other positions of the air mover unit is covered within the scope of the invention. For example, the air mover unit positioned adjacent the opening 3608 and not housed within the opening such that the axis of the air mover unit coincides with the axis of the opening. In such configuration the air mover unit directs the air flow towards the opening 3634 of the base unit. In another example, the air mover unit is positioned adjacent the conduit to direct the mixture that exits from the conduit toward the user. The ability to position the air mover unit in different orientations relative to the base unit provides flexibility and variability in its use, directly contributing to improved airflow dynamics within the system. This versatile design allows users to adjust the direction and intensity of the air flow according to specific needs or conditions, enhancing the overall efficiency and effectiveness of the air mover unit when operated in conjunction with the base unit. Such adaptability ensures optimal performance across a wide range of applications.

[0064] As noted above, the conduit is connected to the base unit. In an example, the conduit is in fluid communication with mixing chamber, and during use of the device by the user the conduit conveys the medication to the body part of the user. The exterior of the conduit has a slightly curved, tubular form, transitioning into a thicker, rounded shape towards one end attached to the base unit. The outer walls of the conduit provides durability and protection and are made from biocompatible materials. The conduit is designed to withstand external stresses and strains without deforming. Additionally, the surface of the outer walls is often treated with antimicrobial coatings to prevent biofilm formation and reduce the risk of infection. The inner walls are smooth for unhindered flow of fluids, gases or medication, minimizing turbulence and blockages. The smooth inner walls also prevent

adherence of biological materials or other substances, that leads to contamination or obstruction. The conduit can be made from a diverse array of materials, based on properties and suitability for specific applications. For instance, flexible plastics such as polyvinyl chloride (PVC) and polyethylene (PE) are commonly used for their lightweight nature, flexibility, and chemical resistance. Metals like stainless steel and aluminum are chosen for their durability, resistance to high pressures, and ability to withstand extreme temperatures, lending themselves well to industrial and high-strength applications. Silicone, known for its flexibility, non-reactivity, and thermal stability, is often used that require a sterile environment and exposure to fluctuating temperatures. The conduit, as shown in the figure is cylindrical, to easily connect to the opening of the base unit on one end and to other additional components on the other end. It is noted that other shapes, such as rectangular, square, or elliptical shape are covered in the scope of the invention.

[0065] FIG. 3G shows a removable cap 3640 attached to the opening 3608 of the base unit. As shown in the figure, the device having the opening is covered by the removable cap 3640, and creates a capped chamber or a sealed compartment within the device. When the device is activated, the device induces the removable capsule's contents, the medication, to atomize into a fine mist by dispensing the medication from the capsule, which is in fluid communication with this capped chamber, into the capped chamber itself. Within this capped chamber, the atomized medication, released from the removable capsule, is effectively mixed with air. This process transforms the medication into the fine mist, which is then directed through an opening connected to a conduit, ultimately reaching the user. The resulting aerosolized medication is administered to the user. The capped chamber provides a consistent and efficient mixture of air and atomized medication. This mixing process creates the fine mist that can be easily inhaled, optimizing the delivery of the medication to the user's lungs. Additionally, the capped or sealed nature of the chamber prevents the escape of medication into the environment, minimizing waste and ensuring that the full dosage is delivered to the user. The design feature is particularly beneficial for individuals with respiratory conditions, as it ensures the delivery of medication in a manner that maximizes absorption and efficacy.

[0066] These removable caps may have various shapes and sizes, tailored to meet specific needs and preferences of the user. The shape of the cap can range from simple cylindrical

or conical designs to more complex geometries that may include ergonomic features for easier handling. The size of the cap ensures a precise fit over the opening of the device to create an effective capped chamber for medication mixing. Larger caps may facilitate easier manipulation by users, and smaller caps can contribute to a more compact and portable device design.

[0067] In another embodiment, a resilient bladder 3642 is attached to the opening 3608 of the device, shown in FIG. 3H. The resilient bladder is attached such that the bladder is in fluid communication with the mixing chamber of the device. The air bladder has a bladder body 3644 and a connecting portion 3646, and manages the air flow within the device. The connecting portion, typically tubular in shape, is designed to attach or be partially inserted within the opening of the device, creating a seamless connection through which air can be directed. The primary function of the bladder is to be manually compressed by the user, thereby propelling air into the device to facilitate the mixing and delivery of the atomized medication.

[0068] Various size of the bladder is covered within the scope of the invention. A larger bladder allows for a greater volume of air to be stored and subsequently pushed through the device with each compression, potentially delivering a more potent dose of medication in a single breath. Conversely, a smaller bladder offers more precise control over the air flow, enabling a more measured and gentle delivery of medication. This can be particularly advantageous for users with sensitive respiratory conditions or those requiring a lower dosage of medication. The choice of bladder size should be aligned with the specific needs and capabilities of the user, ensuring that the device is both effective and comfortable to use.

[0069] The resilient air bladder provides the user with direct control over the air flow and, consequently, the dosage of medication delivered. This allows for a more personalized treatment regimen, catering to the varying needs of users with different respiratory conditions. Secondly, the manual operation of the air bladder eliminates the need for external power sources or complicated mechanisms, enhancing the device's portability and reliability. Further, the resilient air bladder provides a manual mechanism for air flow control, the device becomes more accessible and user-friendly, particularly for elderly users or those with limited technical proficiency.

[0070] In an embodiment, an ocular tube 3648 is attached to the conduit 3603. The ocular tube 3648 has a base tube 3649 and an eye cup 3651. In an example, the ocular tube houses the eye cup at a distant end for administering the medication in a mist form directly to eyes of the user. These tubes, designed to administer medication in mist form or liquid form directly to the eye. The ocular tube is made from a range of materials, each selected for their safety, durability, and compatibility with sensitive ocular tissues. Common materials include soft, flexible plastics that are gentle on the eye and minimize irritation or allergic reactions. The types of ocular tubes can vary based on their design, functionality, and the specific medication they are intended to deliver. Some are designed for single-use, disposable applications, ensuring sterility and preventing contamination, while others may be reusable for chronic conditions, featuring replaceable cartridges of medication. The use of ocular tubes offers a precise and controlled method of medication delivery, directly targeting the affected area and minimizing systemic absorption. This localized approach to treatment allows for lower dosages of medication, reducing the risk of side effects commonly associated with oral or injectable medications. Additionally, the design of these tubes ensures that the medication is distributed evenly across the surface of the eye, improving efficacy.

[0071] The ocular tube has an integrated eye cup. The eye cup has a sealing portion 3647 designed to securely cover and seal over a specific area of the skin. The sealing portion has a semi-spherical shaped body to enclose medication mist, ensuring that it remains concentrated near the treatment area. The semi-spherical shape of the cup provides a curved design that conforms over the area of the skin, ensuring that the medication is precisely targeted and contained to the aera. This curved shape is beneficial because it creates an efficient seal against the skin, minimizing medication wastage and enhancing the concentration of treatment at the site of application, thereby increasing the efficacy of the therapy. This design is particularly beneficial for administering targeted therapy to areas affected by burns, lacerations, wounds, or lesions, as it creates an isolated environment that enhances the effectiveness of the treatment. By maintaining a high concentration of the therapeutic mist within the immediate vicinity of the affected area, the eye cup facilitates optimal absorption of the medication, thereby accelerating the healing process and improving treatment outcomes for various skin conditions.

[0072] The eye cup is designed to fit securely over the user's eye, creating a seal that prevents medication or other substances such as therapeutic or cosmetic substances from leaking out during administration. The connection is achieved through a snug-fitting mechanism where the ocular tube is either inserted into a central opening in the eye cup or attached via a flexible connector. This ensures that the medication is confined to the ocular area, maximizing absorption by the eye's surface and reducing waste. The eye cup is typically crafted from materials prioritizing safety, comfort, and effectiveness. Medical-grade silicone or rubber stands out as a preferred material, due to its flexibility, durability, and hypoallergenic properties. Silicone's softness ensures comfort against the sensitive skin around the eye, while its non-reactive nature prevents irritation or allergic reactions, making it ideal for direct contact with the eye area. Moreover, silicone's resilience allows for repeated use and easy cleaning, supporting both disposable and reusable eye cup designs, thus ensuring the safe and efficient delivery of various ocular treatments. The ocular tube and the eye cup improve the process of applying eye medication, particularly for elderly users or those with limited dexterity. The use of an eye cup reduces the risk of contamination, as the medication is transferred from the tube to the eye without coming into contact with external surfaces.

[0073] In an alternative embodiment, the ocular tube and the eye cup is utilized for delivering therapeutic and cosmetic substances directly to the user's face for skincare and eye treatments. Therapeutic substances can include hydrating serums and anti-inflammatory solutions aimed at treating eye-related conditions or providing relief to the sensitive skin around the eyes. For cosmetic applications, substances might range from anti-aging serums rich in vitamins and antioxidants, designed to diminish wrinkles and fine lines, brightening solutions that address dark circles and puffiness, revitalizing the skin's appearance. For delivering the substance, the ocular tube and the eye cup is correctly positioned on the face of the user. The eye cup is designed to fit snugly over the user's eye or against the targeted area on the face, creating a sealed environment that prevents spillage and ensures that the substance is confined to the desired area. This positioning improves effectiveness of the treatment, as it allows for direct application of the substance to the area that requires treatment or enhancement. Once the eye cup is securely in place, the pharmaceutical, therapeutic or cosmetic substance is gently released from the ocular tube

into the eye cup in the form of a fine mist. The delivery is especially gentle on the sensitive skin around the eyes and allows for the substance to be evenly distributed across the targeted area. The fine mist ensures that the substance is absorbed efficiently by the skin, maximizing the therapeutic or cosmetic benefits. Thereafter, the eye cup is gently moved or hovered from one point to another over the entire targeted region. This movement helps to cover the entire area evenly, ensuring that no part of the targeted region is missed. This process not only enhances the effectiveness of the substance being applied but also contributes to a soothing and pleasant application experience for the user.

[0074] In another embodiment, a spraying catheter tube 3650 is attached to the conduit 3603, using an adapter 3652 in FIG. 3J. The spraying catheter tube 3650 has an elongated body having a flexible tube segment for inserting into a user's body, and an adjustable tip 3655 portion that can be oriented differently, allowing for directional adjustment of an outlet tip for medication delivery to a target region inside the user's body. In an example, the target region is a tooth within a mouth of the user or an internal organ of the user. The primary function of this spraying catheter tube is to facilitate targeted medication delivery during treatments that require localized drug administration. The elongated body of the tube incorporates the flexible segment, designed for safe and minimally invasive insertion into a patient's body. This design aspect ensures that the catheter can navigate through the body's pathways, reaching internal regions without causing significant discomfort or trauma to the patient. The adjustable tip portion can be oriented in various directions, allowing healthcare providers to adjust the outlet's direction to align with the target area for medication delivery accurately. Such a feature is particularly beneficial when addressing conditions localized within specific internal regions, requiring direct treatment application. The ability to adjust the direction of the medication outlet ensures that the drug is administered efficiently and effectively to the intended area, minimizing wastage and enhancing the treatment's impact.

[0075] The tip of the spraying catheter tube is made from materials distinct from those of the flexible tube segment. The flexible segment is made from materials for flexibility and biocompatibility to navigate the body's internal pathways without causing irritation or injury, the material of the tip is chosen for its durability and the precise control. In an example, medical-grade silicone or rubber is used for the flexible segment and the material

for the tip is more rigid, and biocompatible material like polyurethane or a specialized polymer that can withstand repeated directional adjustments and exposure to various medications without degrading. This different materials of the flexible segment and the tip provides that the catheter combines the necessary flexibility for insertion and navigation with the robustness required for precise, repeated medication application.

[0076] The tip may be attached to the flexible segment using various techniques. This connection can be achieved through several methods, each designed to secure the tip while allowing for its necessary movement and orientation adjustments. One common approach is the use of a locking mechanism, where the tip snaps into a predefined position on the flexible segment, ensuring a secure yet adjustable connection. Another method involves the use of medical-grade adhesives that bond the tip to the segment without compromising the flexibility or adjustability required for operation. In another example, the tip and segment is manufactured as a single piece, using a dual-material injection molding process that seamlessly transitions from the flexible material of the segment to the more rigid material of the tip.

[0077] The adapter 3652 attaches the spraying catheter tube with the conduit of the device to provide a seamless and secure connection. Th adapter accommodates the physical and operational disparities between the catheter and the device, facilitating a robust yet flexible link that can withstand the rigors of medical procedures. The adapter's provides a stable connection that maintains the integrity and functionality of the catheter while allowing for easy attachment and detachment from the device, catering to various clinical needs. In an example, the adapter has a locking mechanism, such as a latch or a twist-lock system, which secures the adapter to the flexible segment of the catheter. This ensures that once attached, the catheter remains firmly in place during use. For attachment to the flexible segment, methods such as mechanical fit, adhesives, or even a quick-release mechanism may be employed, offering flexibility in how the catheter is assembled and used. Additionally, the adapter has connection element with predefined dimension or threading, that matches the opening of the device. This design consideration allows for a snug and secure fit, minimizing the risk of disconnection or leakage during medication delivery. The adapters allow the spray catheter to be easily attached and detached from the device either for replacement, cleaning, or to adapt the device for different uses.

[0078] In another embodiment, a mouthpiece 3654 as shown in FIG. 3K is attached to the conduit of the device. The mouthpiece defines a tubular shaped body to be inserted into a user's mouth. The mouth piece has predefined dimensions to fit comfortably within the user's mouth. Its attachment to the conduit facilitates a direct pathway for medication from the device to the target area within the mouth, such as specific teeth, gums, or other oral tissues requiring treatment. The mouthpiece may be fitting snugly and comfortably within the user's mouth, to ensure that the medication is delivered precisely where it is needed, maximizing the efficacy of the treatment while minimizing waste and exposure to non-targeted areas. The material composition and ergonomic design of the mouthpiece are crucial for ensuring patient comfort and effective delivery of medication. The mouth piece is made from medical-grade materials that are both durable and non-irritating to the sensitive tissues within the mouth, the mouthpiece is designed to withstand repeated use while maintaining its shape and integrity. The attachment mechanism between the mouthpiece and the conduit is designed for secure yet easily adjustable connections, allowing healthcare providers to quickly attach or detach the mouthpiece as needed for cleaning, replacement, or adjustment. The material used for the mouthpiece may include medical-grade silicone, thermoplastic elastomers (TPE), and polyurethane. Medical-grade silicone is widely used for its flexibility, resistance to bacterial growth, and comfort against soft tissues. Thermoplastic elastomers offer a unique blend of plastic and rubber properties, providing a softer, more adaptable fit within the user's mouth while ensuring ease of cleaning and sterilization. Polyurethane provides toughness and flexibility, capable of withstanding repeated use without losing shape or integrity.

[0079] In operation, with reference to FIG. 3F, the device 3600 has a base unit that defines the channel 3629 and various openings 3634 and 3637. The removable capsule 3610, which contains the medication 3628, is placed into the channel 3629 within the device. This initial step ensures that the capsule is properly aligned and secured for the subsequent atomization process. Following this, the atomizer 3626 within the device is powered on, initiating the transformation of the contained medication into a fine mist form. This atomization process breaks down the medication into minuscule particles, making it easier for the body to absorb and increasing the efficacy of the treatment. Once atomized, the atomized medication particles 3630 are then introduced into the mixing chamber 3624, where they

are thoroughly mixed with air molecules 3632. The mixing forms the homogenized mixture, ensuring that the medication is evenly distributed within the air, ready for delivery to the user.

[0080] In conveying the homogenized mixture to the user, the device employs distinct mechanisms in different embodiments, the air mover unit and the resilient bladder. In the first example, the air mover unit 3606 propels the mixture through a portion of the conduit 3603 and out of the device, utilizing a fan or similar mechanism to generate airflow in the direction of arrows 3636. This method is particularly effective for a consistent and controlled delivery of the medication. Alternatively, in another embodiment, a resilient bladder, such as the resilient bladder 3642 shown in FIG. 3H is used to convey the mixture. The bladder, through its expansion and contraction, forces the medication-air mixture through the conduit, offering a different method of delivery that can be precisely controlled based on the degree of pressure applied. Both methods ensure that the medication is delivered efficiently and directly to the required site, highlighting the device's flexibility and adaptability in meeting various medical needs.

[0081] In another embodiment, a wearable headset or a mask designed for direct connection to the conduit of the base unit, may be attached to the conduit of the base unit. The headset or the mask may facilitate delivery of nebulized medicine to the user's face and/or eyes. This wearable device is equipped with a connecting tubular portion that seamlessly inserts into the opening of the base unit, establishing a secure and efficient pathway for the nebulized substance. Incorporated within the headset or mask are finely calibrated nozzles, placed to uniformly distribute the fine mist across the facial or ocular regions of the user. These nozzles are meticulously designed to ensure that the nebulized medication or therapeutic substance is delivered in an evenly dispersed manner, optimizing the effectiveness of treatment and enhancing the user experience. Furthermore, the headset or mask may be used therapeutic and cosmetic uses as well. The headset or the mask may be used to deliver medications, therapeutic substances for relaxation and skin care, or cosmetic products for hydration and rejuvenation. The uniform dispersion of substances through the nozzles ensures that the fine mist reaches the target area effectively, maximizing absorption and benefits. The mask may fit over targeted areas, providing a versatile solution for delivering substances to treat a variety of conditions. The mask allows

covering general skin surfaces affected by burns, facilitating direct treatment and healing, and more sensitive regions such as the external and internal vaginal areas. This capability ensures that treatments can be applied in a precise, controlled manner, directly where needed, while maintaining the comfort and privacy of the user. The mask's ability to conform to different body contours and effectively seal the treatment area optimizes the delivery and absorption of therapeutic or cosmetic substances, enhancing the efficacy of the treatment for skin rejuvenation, healing of burns, or addressing conditions specific to the vaginal areas.

[0082] FIG. 3L is a flowchart diagram illustrating steps for a method for conveying substance to a subject using the removable air unit. The method is explained with reference to FIGS. 3D through 3F. In an example, the term subject includes a user, a plant, agricultural crops, ornamental plants, trees, shrubs, and grasses, among others, and an animal. In step 3656, the method initiates with providing a removable capsule having an atomizer. The capsule is a container for the medication but also houses the atomizer for creating a fine mist or aerosol of the medication, facilitating more efficient and targeted delivery within the body. As shown in FIG. 3D and 3F, the removable capsule 3610 is inserted within the channel 3629. The atomizer 3626 provides the substance that can be administered in a form that is readily absorbed by the body's tissues.

[0083] In an embodiment, the substance comprises a fertilizer material for delivering in mist form to plants, providing essential nutrients to plants through a fine spray or aerosol. This provides a more direct and efficient uptake of nutrients by the plants' leaves and roots. The device may be used in agricultural practices such as hydroponics or aeroponics, that utilizes water-soluble fertilizers dissolved in water to form a nutrient-rich solution. Examples of such fertilizer materials include but are not limited to, nitrogen, phosphorus, and potassium compounds, which are crucial for plant growth, along with trace elements like iron, manganese, and zinc. The delivery mechanism involves nebulizing the solution into tiny droplets that can be evenly distributed over the plants, allowing for immediate absorption through the stomata on the leaves, and the roots. The mist form of the fertilizer optimizes water and nutrient use and promotes healthier, more robust plant growth by ensuring that plants receive a balanced supply of essential nutrients directly to their active growth sites.

[0084] In step 3658, the process involves inserting the removable capsule into a channel specifically designed within the base unit of the device. This step ensures that the capsule is correctly positioned to interface with the device's internal systems, such as the mixing chamber and the atomizer activation mechanism. The channel within the base unit accommodates the capsule snugly, securing it in place to prevent any displacement during operation and ensuring an optimal alignment with the device's delivery and mixing systems. After insertion of the capsule, step 3660 involves dispensing, using the atomizer, the substance from the removable capsule to the mixing chamber of the base unit. FIG. 3F shows the atomized substance, such as medication particles 3630 in mist form that is dispensed from the atomizer 3626 to the mixing chamber 3624. This action dispenses the medication in a finely atomized form, directing it into the mixing chamber of the base unit. The mixing chamber serves as the area where the atomized medication is prepared for inhalation or delivery by mixing with the air molecules 3632, ensuring a uniform and controlled mixture. Thereafter, in step 3662, using the removable air mover unit, causing air and the substance within the mixing chamber to be conveyed from the mixing chamber to the conduit. FIG. 3F shows the removable air unit 3606 blowing air in the direction of arrows 3636 towards the opening 3634. The air mover unit is integral to the system, propelling air through the mixing chamber, thereby conveying the atomized medication from the mixing chamber 3624 into the conduit 3603 via the opening 3634. The conduit then serves as the passage through which the medication-air mixture is delivered to the user. This sequence of steps highlights a methodical approach to medication delivery, emphasizing precision, control, and patient safety in administering treatments. As noted above, additional application of the device are covered within the scope of the present invention. The device can also be used to administer substances for therapeutic and cosmetic purposes. In addition to health-related treatments, the device can be utilized for cosmetic treatments, providing a versatile tool for both medical professionals and for personal care and cosmetic enhancements. Therapeutically, it can administer medications such as bronchodilators and corticosteroids for respiratory conditions, insulin for diabetes management, and antibiotics or antivirals for infections, providing a non-invasive route of administration that enhances patient comfort and compliance. Additionally, it can deliver pain management medications, offering an alternative for those seeking quick relief

without the need for oral intake or injections. On the cosmetic front, the device can be used to apply substances like hydrating mists, anti-aging treatments, and targeted skin serums. These cosmetic applications benefit from the atomization process, which allows for a finer and more even distribution of the product, potentially increasing absorption and efficacy. Whether for managing health conditions or enhancing beauty routines, this device opens up new possibilities for delivering a variety of substances directly and efficiently to the user.

[0085] FIG. 3M is a flowchart diagram of a method for administering the medication to the user from the capped chamber. In step 3664, the method includes attaching a cap to cover an opening of the base unit, for a capped chamber. In an example, the cap is the removable cap 3640 that is fitted inside the opening 3608, as shown in FIG. 3G, to completely cover the opening and form the capped chamber. In the next step 3666, the method includes dispensing, using the atomizer, the substance from the removable capsule to the capped chamber of the base unit. The process of dispensing medication from the removable capsule into the capped chamber of the base unit via an atomizer ensures precise and efficient delivery of treatment. The atomizer within the capsule transforms the substance into a fine mist, facilitating its controlled release into the capped chamber. The atomized medication particles 3630 are shown to be introduced in the mixing chamber 3624 of FIG. 3F. Following atomization, the atomized substance, such as the medication is introduced into the mixing chamber, where it combines with air. The introduction of the atomized medication into the mixing chamber creates a pressure on the mixture and acts as a driving force, propelling the mixture through the conduit in a controlled manner. This method ensures that the medication is not only effectively atomized for optimal delivery but also efficiently conveyed through the device, ensuring a precise and consistent dosage reaches the user.

[0086] In the next step 3668, the method involves administering the substance to the user by conveying the substance from the capped chamber. This chamber, designed to temporarily hold the atomized medication, serves as a mixing area where the substance or the medication is stabilized and readied for patient administration. The method optimizes the delivery of medication by ensuring a consistent dosage and improves patient comfort by providing a non-invasive means of administration of the medication. The capped

chamber ensures that the mixture is contained securely, minimizing loss or dispersion of the medication into the surrounding environment, thereby maximizing the efficiency of the delivery of the medication.

[0087] FIG. 3N illustrates an embodiment having a skin care cup and an elongated tube attached to the base unit of the device. As shown, the skincare cup 3674 is attached to one end of the elongated tube 3672, and the elongated tube 3672 is attached to the base unit of the device 3600 via the adaptor 3652. The adaptor is attached to the conduit 3603 of the device. It is noted that the elongated tube is attached to the device via the adaptor and the elongated tube. In alternative embodiments, the elongated tube can be directly inserted into opening 3634 of device 3600 for attachment.

[0088] The skin care cup 3674 has a sealing member 3676 to form a seal with a skin of the user 3670 when the substance is applied on a portion of the skin 3671 using the device. It is noted that the substance can be pharmaceutical, therapeutic, or cosmetic compounds, that are directly to the user's skin, for treating various skin conditions such as lesions, boils, sores, acne, or allergies. Other skin conditions, such as eczema, characterized by patches of itchy, inflamed skin, psoriasis, and rosacea, fine lines, wrinkles, and age spots, can also be treated using the device. For instance, a pharmaceutical substance could be an antibiotic solution targeted at bacterial skin infections, effectively reducing inflammation and promoting healing. A therapeutic substance might include aloe vera or hyaluronic acid-based serums, renowned for their soothing and moisturizing properties, thereby aiding in the recovery of damaged skin and enhancing hydration. On the cosmetic front, substances like vitamin C or retinol serums could be atomized through the device, offering anti-aging benefits, improving skin texture, and reducing the appearance of fine lines and discoloration. The versatility of this device lies in its ability to atomize these substances into a fine mist, ensuring deep penetration and uniform distribution across the affected area, thereby maximizing the efficacy of the treatment and offering a tailored approach to skin care. This multifaceted device, with its ability to deliver a variety of substances, presents a revolutionary method for addressing a wide spectrum of skin issues, providing users with a personalized and effective skin care solution.

[0089] FIG. 3N shows the substance particles 3678 is released on the affected skin portion having lesions marks 3680 on the skin. The specific portion of the skin affected by the

condition is identified, such as the portion of the skin having the lesion marks 3680. Subsequently, the sealing member of the skin care cup is positioned over the identified area. The sealing member is then engaged to form a tight seal against the skin, ensuring that the portion in contact is effectively isolated for treatment. Once a secure seal is established, the chosen substance, be it a pharmaceutical, therapeutic, or cosmetic compound, is atomized and released into the sealed area, facilitating direct application to the affected skin. The substance released is thoroughly absorbed by the skin, ensuring that the active ingredients are delivered precisely for healing and rejuvenation of the skin.

[0090] The sealing member creates an airtight environment over the treated skin area. This isolation facilitates a concentrated and uninterrupted interaction between the skin and the therapeutic or cosmetic substance being administered. By preventing the dispersion of the substance into the surrounding air, the sealing ensures that a maximum amount of the active ingredients directly contacts the skin, enhancing absorption and efficacy. Moreover, this method minimizes external contaminant exposure and reduces the risk of evaporation of the substance, ensuring that the skin receives a full dose of the treatment. This targeted delivery improves the effectiveness of the treatment for various skin conditions and maximizes the efficient use of the substance.

[0091] In an embodiment, the device is used for delivering substance, such as a pharmaceutical, a therapeutic or a cosmetic substance. As noted above, pharmaceutical substances may include a medication, such as antibiotics or antifungal solutions. In some embodiments, the medication may also include therapeutic substances including a regenerative medication targeting treatment of tissue repair and regeneration in the user. Regenerative medications include bioactive agents or biological agents capable of stimulating cellular growth, differentiation, and repair. The medication may comprise a combination of growth factors, cytokines, stem cells, or other agents known to facilitate tissue regeneration and repair. In another embodiment, the medication comprises one of peptides, proteins, growth factors, cytokines, exosomes, and extracellular vesicles derived from human mesenchymal stem cells suspended and/or dissolved in an aqueous medium. In another embodiment, the medication is an aqueous suspension and solution comprising cells, cellular byproducts, and cell-derived products. The cells, the cellular byproducts, and cell-derived products are stem cells. The bioactive agent and biological agent may be used

interchangeably throughout the document, as the biological agent may have a bioactive effect in some embodiments. In an embodiment, the biological agent including one of stem cells, or exosomes are delivered in a mist form directly to the skin or other targeted regions, such as teeth in the mouth or in open heart surgeries. As noted above, exosomes are small extracellular vesicles, approximately 30 to 150 nanometers in diameter, that are secreted by virtually all cell types. The exosomes provide cell-to-cell communication, carrying proteins, lipids, and nucleic acids between cells. Exosomes can carry and protect bioactive molecules and function as a medium for delivering therapeutic substances to specific areas of the body. Administering exosomes using the described medical device involves atomizing the exosome-containing solution or substance into a fine mist that can be directly applied to the skin or affected regions. The device's sealing member ensures that the exosome-laden mist is confined to the target area, enhancing the local concentration of exosomes and facilitating their absorption and interaction with the skin cells. This method of delivery is particularly beneficial for skin rejuvenation, wound healing, and the treatment of various dermatological conditions. Exosomes can promote tissue repair and regeneration by delivering growth factors, cytokines, and genetic materials that stimulate the body's natural healing processes. Additionally, the targeted delivery of exosomes via the device minimizes wastage and ensures a high efficiency of treatment, providing a focused approach that enhances the therapeutic outcomes. This innovative application of exosome technology heralds a new era in personalized and precision medicine, offering a powerful tool for addressing a wide range of health concerns.

[0092] In one embodiment, the device enables the application of exosomes to the affected skin portion, as depicted in the figure, while in other embodiments, it facilitates the application to different areas of the body, adapting to a wide range of treatment needs. In an embodiment, exosomes can be applied to external and internal regions of the vagina, including the skin around the vagina, offering significant therapeutic benefits. The application of exosomes to the vaginal areas promotes tissue regeneration, enhances cellular communication, and supports healing of mucosal injuries. Further, the anti-inflammatory properties of exosomes reduces inflammation and preventing infections in these sensitive areas. Apart from vaginal health, such an application of exosomes allows for the treatment of other delicate regions, such as oral mucosa, internal wounds, or even

the scalp, where exosomes can aid in tissue repair, soothe irritation, and stimulate regenerative processes.

[0093] In one embodiment, the application of exosomes to treat affected skin areas is using a spray mechanism that atomizes the exosome-containing solution into a fine mist. This method allows for a gentle and even distribution of exosomes over the skin, ensuring that the therapeutic agents are directly and efficiently delivered to the target area. Spraying the mist enables a non-invasive, painless application process, ideal for sensitive or damaged skin, and enhances the absorption of exosomes into deeper layers of the skin. The spraying maximizes the contact between the exosomes and the skin cells, facilitating the delivery of proteins, RNA, and other bioactive molecules to promote healing, reduce inflammation, and encourage tissue regeneration.

[0094] In another embodiment, the device may be used to deliver stem cells and regenerative medicines directly to targeted areas of the body. Examples of stem cells that may be delivered include mesenchymal stem cells (MSCs), that promotes tissue repair, and induced pluripotent stem cells (iPSCs), that can be generated from adult cells and have the potential to treat a wide range of diseases. As for regenerative medicines, growth factors and cytokines may be administered to stimulate the body's healing processes. The device atomizes these stem cells or regenerative medicines into a fine mist, allowing for precise application and deep penetration into the skin or affected tissues. The stem cells and regenerative medicines repair damaged tissues, reduce inflammation, and improve the functionality of organs and tissues. This delivery system maximizes the potential benefits of these treatments by ensuring targeted, efficient, and minimally invasive application.

[0095] FIG. 38C is a flowchart diagram for a method 3830 of conveying the medication using the resilient air bladder. The method for medication delivery utilizing a resilient bladder, such as the resilient bladder of 3642 of FIG. 3H provides precise and controlled dispensing. The resilient bladder functions as an intermediary storage and propulsion device to facilitate the movement of medication. The initial step 3832 involves removing the cap from the base unit. The base unit houses the mixing chamber and provides an interface for various other components, including the resilient bladder. The cap functions as a protective element that secures the contents within the base unit and maintains the sterility of the internal environment. The removal of the cap exposes the opening of the

base unit and creates an accessible pathway for subsequent attachment of the resilient bladder and the conveyance of medication. The next step 3834 entails connecting a portion of the resilient bladder with the base unit. The resilient bladder is designed to be flexible and durable, capable of withstanding the pressures associated with medication conveyance. The resilient bladder can be made from a range of materials, each selected for its specific properties to suit different applications. Common materials include silicone, latex, and various types of rubber, such as natural rubber or synthetic versions like neoprene and nitrile. Silicone is often chosen for its flexibility, durability, and resistance to temperature extremes for medical devices or environments with fluctuating temperatures. Latex, known for its high elasticity and resilience, is suitable for applications requiring tight seals and frequent expansions. Rubbers like neoprene offer excellent chemical resistance and strength, useful in industrial settings where the bladder might be exposed to oils or solvents. Each material brings distinct advantages, allowing the resilient bladder to be tailored to meet the specific requirements of its intended use, for medical devices administering fluids to users.

[0096] For connecting the resilient bladder with the base unit, the bladder is aligned with the designated attachment point or opening on the base unit. For example, the tubular connecting portion 3646 of FIG. 3H of the bladder is aligned with a corresponding receptacle or opening on the base unit. Once aligned, the tubular portion is gently inserted into the opening 3608, ensuring a snug and secure fit. This connection not only facilitates a seamless linkage between the bladder and the base unit but also ensures that there is no leakage or loss of air pressure when the device is operational. The design of the tubular connecting portion allows for easy attachment and detachment, providing flexibility and convenience in the maintenance and operation of the system. In an example, the connection between the bladder and the base unit is secure and leak-proof, such that there is no loss of medication during transfer. The design of the resilient bladder allows it to expand and contract during conveying of the medication. In step 3836, the method includes conveying the at least one medication from the mixing chamber to a portion of the conduit using the resilient bladder. This step leverages the elastic properties of the bladder to move medication with precision. As the bladder contracts, it exerts air pressure on the medication stored within, propelling it through the conduit towards the delivery point. In the

embodiment, the resilient bladder ensures a consistent flow rate and volume of medication delivered to the user.

[0097] Referring to FIG. 38D, a method 3840 for conveying the medication from the mixing chamber to the conduit. The method includes providing a removable capsule having an atomizer, the removable capsule containing the medication in step 3842. In FIGS. 3D and 3F, the removable capsule 3610 is positioned inside the device 3600. The removable capsule 3610 has a capsule chamber 3620, the atomizer 3626 and the medication 3628, such as the medication contained in the removable capsule. It is noted that in other embodiment the medication 3628 contained inside the removable capsule can be a therapeutic substance or a cosmetic substance as noted above. In step 3844, the method includes providing a removable air mover unit in attachment with a base unit of a device. FIGS. 3D and 3F shows the removable air mover unit 3606 that is attached to the base unit via the opening 3637. The air mover unit is a compact unit having electrical contacts on the outer surface of the air mover unit, such that when the air mover unit is fitted within the opening 3637, the electrical contacts of the air mover unit comes in contact with the electrical contacts on an inner wall of the opening. The air mover unit is a compact device equipped with its on-board battery, on-board circuitry, including a printed circuit board (PCB), and a Bluetooth connectivity module. Once the air mover unit comes into contact with the base unit, electrical communication is established between them. This connection enables the base unit to power the air mover unit, activating its operational state. The integration of Bluetooth technology allows for remote operation and monitoring, enhancing the unit's functionality and user convenience.

[0098] In alternative embodiments, different communication standards may be used. For example, Wi-Fi offering a broader range and higher data transfer speeds, which could enhance the efficiency of signal transmission when the air mover unit is in proximity to or attached to the device may be used. In another example, Near Field Communication (NFC) for close-range interactions, enabling a simple tap-to-connect functionality that simplifies the pairing process. Infrared (IR) technology that provides a direct line of sight communication method, ensuring secure connections in controlled environments may be used in between the air mover unit and the device. Additionally, Radio Frequency (RF)

communication, including technologies like Zigbee or Z-Wave, can be utilized for their low-power consumption and reliable connectivity over varying distances.

[0099] In step 3846, the method includes providing a spraying catheter tube connected to the conduit, using an adapter. The spraying tube is connected to the conduit through the use of an adapter. The adapter serves as an interface for securing a linkage between the catheter tube and the conduit. During surgeries, the spray catheter tube provides targeted spraying of medication and therapeutic agents directly to the surgical site, minimizing tissue disturbance and enhancing the efficacy of the medication. This targeted approach facilitates rapid healing, reduces the risk of infection, and ensures that the medication is applied uniformly across the affected area. This configuration optimizes the delivery of fluids directly to the desired location but also enhances the precision and control of the spraying action.

[0100] In the next step 3848, the method includes inserting the removable capsule in a channel of the base unit. As shown in FIG. 3F, the removable capsule in inserted within the channel 3629. The channel 3629 accommodates the removable capsule and serves as a dedicated pathway for insertion and alignment of the removable capsule. This channel ensures that the capsule can be easily and securely positioned within the base unit, facilitating seamless integration with the system's overall functionality. The channel provides a snug fit, preventing any movement of the capsule that may disrupt the device operation. Additionally, this feature allows for the quick replacement or removal of the capsule, enhancing the system's versatility and maintenance efficiency. Theerafter, in step 3850, the method involves dispensing, using the atomizer, the at least one medication from the removable capsule to the mixing chamber. In the next step 3852, the method involves using the removable air mover unit, causing air and the medication within the mixing chamber to be conveyed from the mixing chamber to the conduit. By activating the air mover unit, air is propelled into the mixing chamber, where it interacts with the medication, creating a mixture that is efficiently conveyed through the conduit. This process ensures a homogenous distribution of medication within the air stream, optimizing the delivery mechanism for therapeutic applications. The inclusion of a removable air mover unit enhances the system's flexibility and ensures precise control over the medication delivery rate.

[0101] Delivering medication through a long spraying catheter that incorporates multiple bends can present challenges due to the potential for uneven medication distribution and resistance to flow, which may result in reduced efficacy of delivery to the targeted site. The complexity of navigating the medication through the catheter's turns can lead to accumulation at bends, thereby affecting the uniformity and speed of the medication's travel. The air mover unit addresses these challenges by propelling a consistent stream of air through the mixing chamber, where the medication is held, into the conduit and subsequently through the spraying catheter. This air stream acts as a carrier for the medication, ensuring that it remains suspended and mixed within the air flow. As a result, the medication is able to maintain a uniform distribution throughout its transfer, even when navigating through the catheter's lengthy path and turns. The air mover unit's mechanism significantly improves the precision and effectiveness of medication delivery, ensuring that the medication is evenly dispersed and reaches the intended site with optimal coverage.

[0102] FIG. 38E illustrates a method 3860 for attaching an ocular tube to the conduit of the base unit. In step 3862, the method involves removing the spraying catheter tube from the conduit of the base unit. In one example, the spraying catheter tube 3650 of FIG. 3J is detached from the conduit 3603 of the base unit for cleaning, or replacement purposes. The removing of the spraying catheter is performed carefully to ensure that the connection between the catheter tube and the conduit is safely disconnected without damaging either component. The removal process begins by gently disengaging any locking mechanism or an adapter, such as the adapter 3652 that secures the catheter tube to the conduit, followed by a controlled withdrawal of the tube from the conduit's opening. In another example, the step of removing the spray catheter may be performed for attaching any other component to the conduit. In the next step 3864, the method includes attaching an ocular tube to the conduit, the ocular tube housing an eyepiece at a distant end for administering the at least one medication in a mist form directly to eyes of the user.

[0103] For example, the ocular tube 3648 is attached to the conduit 3603 of the base unit as shown in FIG. 3I. The attachment of an ocular tube equipped with an eye cup to the conduit serves a specialized and crucial purpose in medical applications, particularly in administering treatments directly to the eye. This design facilitates precise and gentle delivery of medication or therapeutic solutions to the delicate ocular surface. The eye cup,

when attached to the ocular tube and subsequently to the conduit, forms a sealed environment around the eye, minimizing the risk of medication spillage or dispersal to surrounding areas. This targeted delivery mechanism not only enhances the efficacy of the treatment by ensuring that the medication is concentrated at the site of application but also improves patient comfort and safety by preventing irritation to adjacent tissues. Furthermore, this setup is instrumental in treatments requiring controlled and localized administration of medication, offering a high degree of accuracy and effectiveness in ocular therapy.

[0104] Although the subject matter has been described in language specific to structural features and/or methodological acts, it is to be understood that the subject matter defined in the appended claims is not necessarily limited to the specific features or acts described above. Rather, the specific features and acts described above are disclosed as example forms of implementing the claims.

Claims

1. A method for administering at least one substance to a subject, the method comprising:

providing a removable capsule having an atomizer;

inserting the removable capsule in a channel of a base unit of a device, the channel in fluid communication with a mixing chamber of the base unit, the base unit defining openings on the base unit configured to receive a portion of a conduit and a removable air mover unit, wherein the removable air mover unit is electrically connected directly to the base unit;

dispensing, using the atomizer, the at least one substance from the removable capsule to the mixing chamber of the base unit, wherein the at least one substance is combined with air in the mixing chamber; and

using the removable air mover unit, causing air and the at least one substance within the mixing chamber to be conveyed from the mixing chamber to the conduit such that air and the at least one substance dispensed from the removable capsule exits the conduit.

2. The method of claim 1 further comprising attaching an ocular tube to the conduit, the ocular tube housing an eye cup at a distant end configured for administering the at least one substance in a mist form directly to eyes of a user.

3. The method of claim 1, wherein the removable air mover unit is in attachment with the base unit of the device, such that a central axis of the removable air mover unit aligns with a central axis of the portion of the conduit.

4. The method of claim 1 further comprising: removing the removable air mover unit from the base unit;

attaching a cap to cover an opening of the base unit, for a capped chamber;

dispensing, using the atomizer, the at least one substance from the removable capsule to the capped chamber of the base unit; and

administering the at least one substance to a user by conveying the at least one substance from the capped chamber.

5. The method of claim 4 further comprising:

removing the cap from the base unit;

connecting a portion of a resilient bladder with the base unit, such that the resilient bladder in in fluid communication with the mixing chamber of the base unit; and

conveying the at least one substance from the mixing chamber to a portion of the conduit though the resilient bladder.

6. The method of claim 1, wherein the removable air mover unit is in direct electrical connection with the base unit of the device and an outward surface of the removable air mover unit abuts an inner wall of an opening that receives the removable air mover unit, wherein a first electrical contact is disposed on the outward surface of the removable air mover unit, and a second electrical contact is disposed on the inner wall of an opening that receives the removable air mover unit to provide electrical communication between the removable air mover unit and the base unit of the device.

7. The method of claim 1 wherein the removable air mover unit is disposed adjacent to the base unit such that the removable air mover unit is in fluid communication with the mixing chamber of the device.

8. The method of claim 1, wherein the removable air mover unit comprises a fan , an on-board battery, on-board circuitry, and a power cord, the power cord configured to connect with the base unit for electrical communication.

9. The method of claim 1, wherein the at least one substance comprises a fertilizer for delivering in mist form to a plant.

10. The method of claim 1 comprising connecting a spraying catheter tube to the conduit, using an adapter, wherein the spraying catheter tube has an elongated body comprising a flexible tube segment configured for inserting into a user's body, and an adjustable tip portion that is oriented differently for allowing directional adjustment of an outlet tip for medication delivery to a target region inside the user's body, wherein the target region is a tooth within a mouth or an internal organ of the user.

11. A system for administering at least one substance to a body part of a user, the system comprising:

a removable capsule comprising the at least one substance, wherein the at least one substance is a biological agent;

an atomizer disposed directly adjacent to a capsule chamber of the removable capsule, wherein the at least one substance contacts the atomizer within the capsule chamber;

a base unit of a device comprising a mixing chamber and a plurality of openings in fluid communication with the mixing chamber;

a removable air mover unit attached to the base unit of the device via an opening of the plurality of openings on the base unit, wherein an outward surface of the removable air mover unit abuts an inner wall of the opening that receives the removable air mover unit;

the removable air mover unit is in fluid communication with the mixing chamber of the base unit, the removable air mover unit configured such that air conveyed from the removable air mover unit moves into the mixing chamber, wherein the removable air mover unit is in direct electrical connection with the base unit of the device and a first electrical contact is disposed on the outward surface of the removable air mover unit and a second electrical contact is disposed on the inner wall of the opening of the base unit for providing electrical communication between the removable air mover unit and the base unit; and

a conduit connected to the base unit and in fluid communication with mixing chamber, the conduit configured to convey the at least one substance to the body part of the user.

12. The system of claim 11, further comprising an ocular tube attached to the conduit, the ocular tube housing an eye cup at a distant end for administering the at least one substance in a mist form directly to eyes of the user.

13. The system of claim 11, further comprising a mouthpiece attached to the conduit, wherein the mouthpiece defines a tubular shaped body to be inserted into a user's mouth, and the mouthpiece is in fluid communication with the mixing chamber of the base unit.

14. The system of claim 11, wherein the removable air mover unit comprises a fan, an on-board battery, and an on-board circuitry.

15. The system of claim 11 comprising a spraying catheter tube attached to the conduit, using an adapter, wherein the spraying catheter tube has an elongated body comprising a flexible tube segment configured for inserting into a user's body, and an adjustable tip portion that can be oriented differently, allowing for directional adjustment of an outlet tip for medication delivery to a target region inside the user's body, wherein the target region is a tooth within a mouth of the user or an internal organ of the user.

16. A method for administering at least one substance to a body part of a user, the method comprising:

providing a removable capsule having an atomizer, the removable capsule containing the at least one substance, wherein the at least one substance is one of a medication, a therapeutic substance and a cosmetic substance;

providing a removable air mover unit in attachment with a base unit of a device, the base unit defining openings on the base unit configured to receive a portion of a conduit and the removable air mover unit such that the removable air mover unit is in fluid communication with a mixing chamber within the device;

providing a spraying catheter tube connected to the conduit, using an adapter, wherein the spraying catheter tube has an elongated body comprising a flexible tube segment configured for inserting into a user's body, and an adjustable tip portion that is oriented differently for allowing directional adjustment of the adjustable tip portion for medication delivery to a target region inside the user's body, wherein the target region is a tooth within a mouth of the user or an internal organ of the user;

inserting the removable capsule in a channel of the base unit, the channel in fluid communication with a mixing chamber of the base unit,

dispensing, using the atomizer, the at least one substance from the removable capsule to the mixing chamber of the base unit, wherein the at least one substance is combined with air in the mixing chamber; and

using the removable air mover unit, causing air and the at least one substance within the mixing chamber to be conveyed from the mixing chamber to the conduit such that air and the at least one substance dispensed from the removable capsule exits the conduit.

17. The method of claim 16, wherein an outward surface of the removable air mover unit abuts an inner wall of an opening that receives the removable air mover unit and the removable air mover unit is in direct electrical connection with the base unit, wherein a first electrical contact is disposed on the outward surface of the removable air mover unit, and a second electrical contact is disposed on the inner wall of the opening that receives the removable air mover unit for providing electrical communication between the removable air mover unit and the base unit of the device.

18. The method of claim 17 further comprising:

removing the removable air mover unit from the base unit;

attaching a cap to cover the opening of the base unit, for a capped chamber;

dispensing, using the atomizer, the at least one substance from the removable capsule to the capped chamber of the base unit; and

administering the at least one substance to the user by conveying the at least one substance from the capped chamber.

19. The method of claim 18 further comprising:

removing the cap from the base unit;

connecting a portion of a resilient bladder with the base unit, such that the resilient bladder in in fluid communication with the mixing chamber of the base unit; and

conveying the at least one substance from the mixing chamber to a portion of the conduit though the resilient bladder.

20. The method of claim 19, further comprising:

removing the spraying catheter tube from the conduit of the base unit; and

attaching an ocular tube to the conduit, the ocular tube housing an eye cup at a distant end for administering the at least one substance in a mist form directly to eyes and skin of the user.

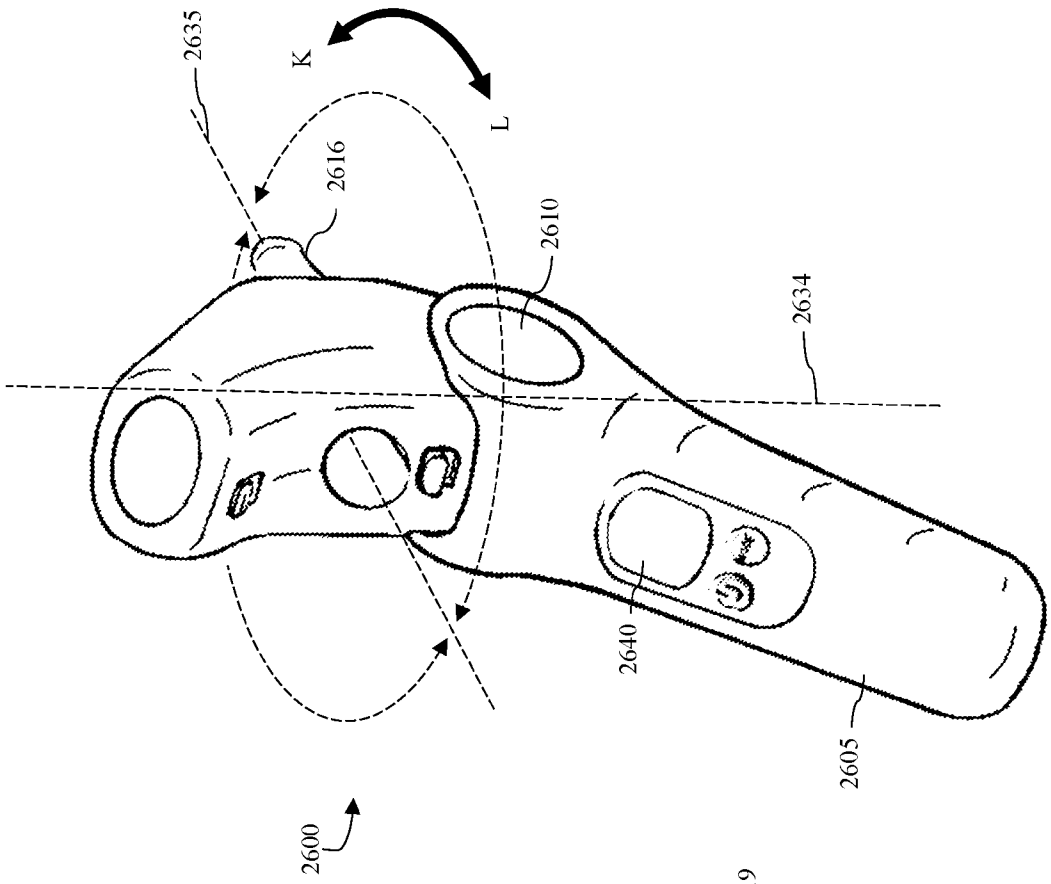

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Fig. 2

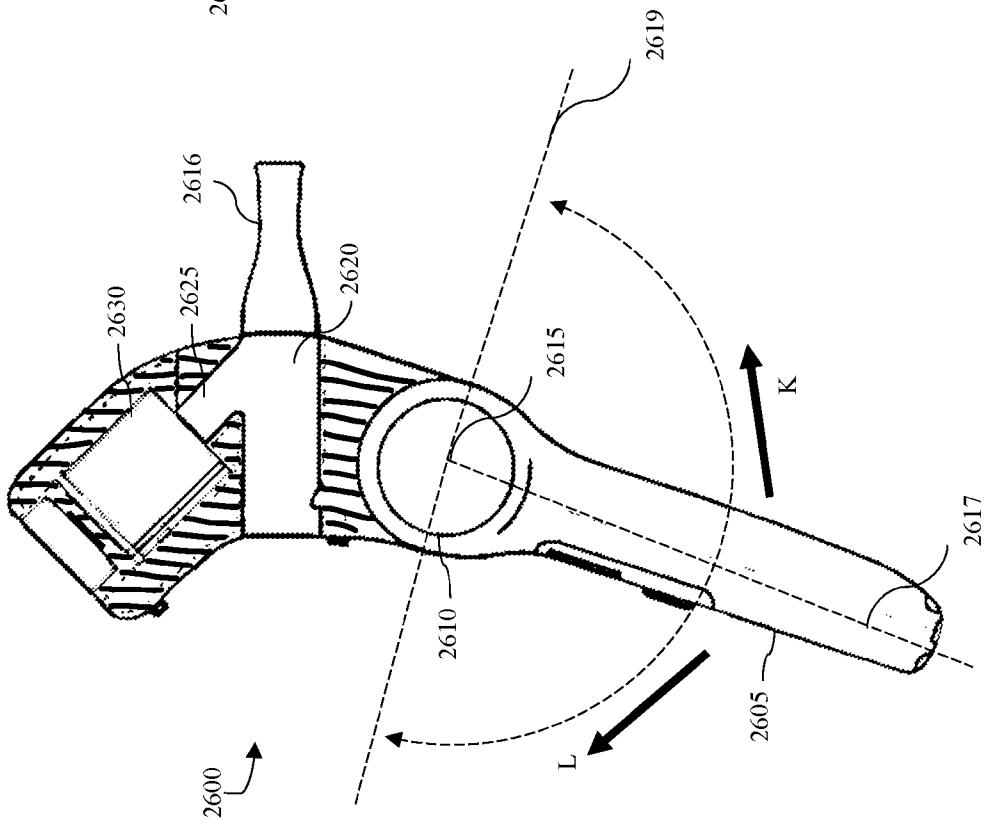

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Fig. 1

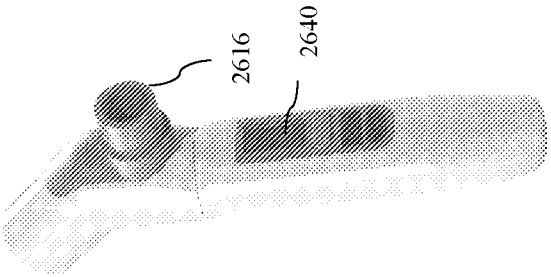


Fig. 3C

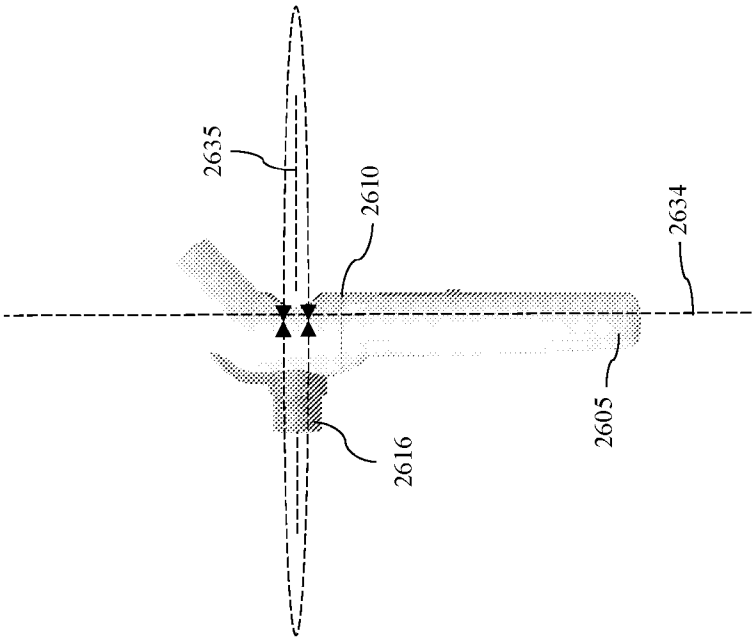


Fig. 3B

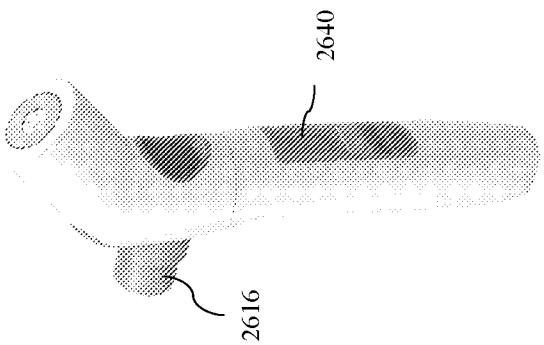


Fig. 3A

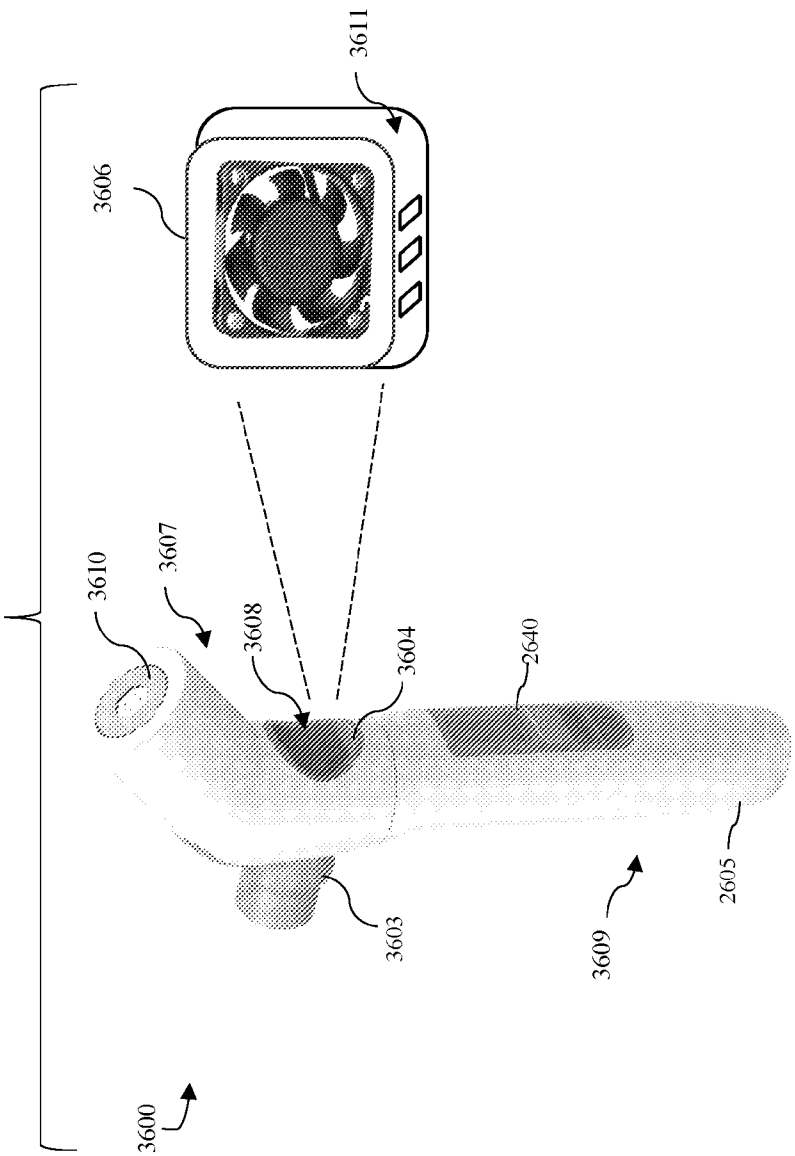


Fig. 3D

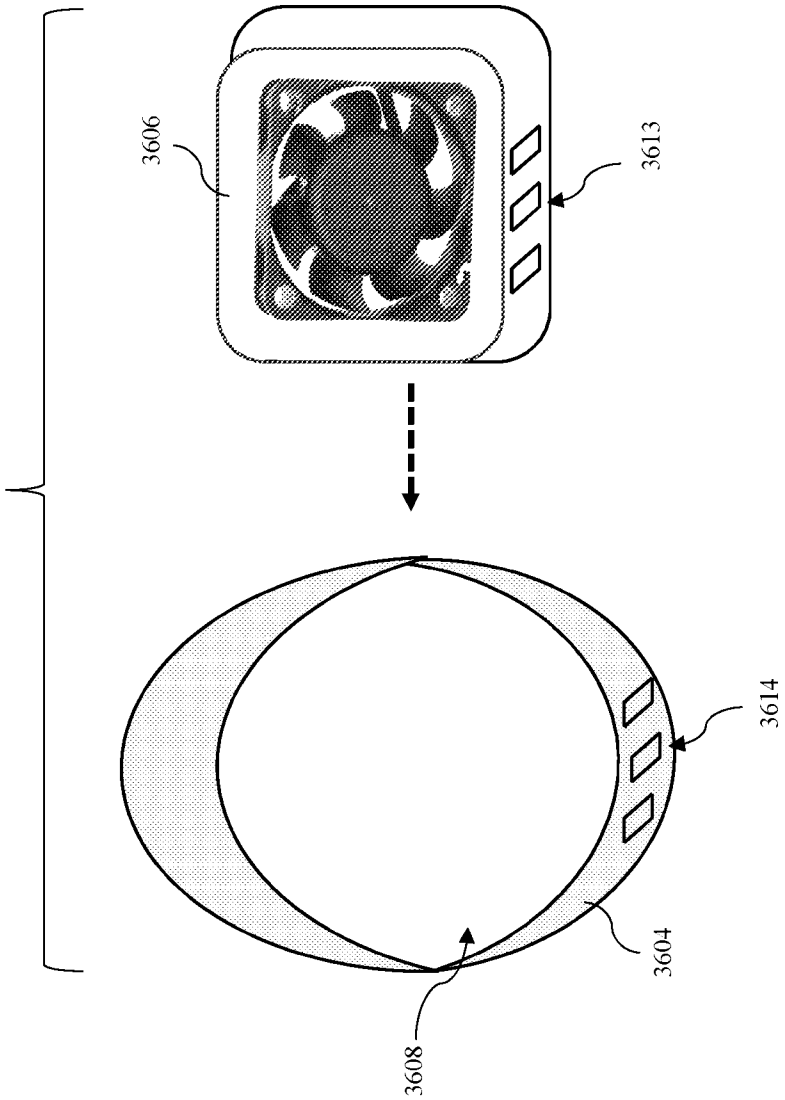


Fig. 3E

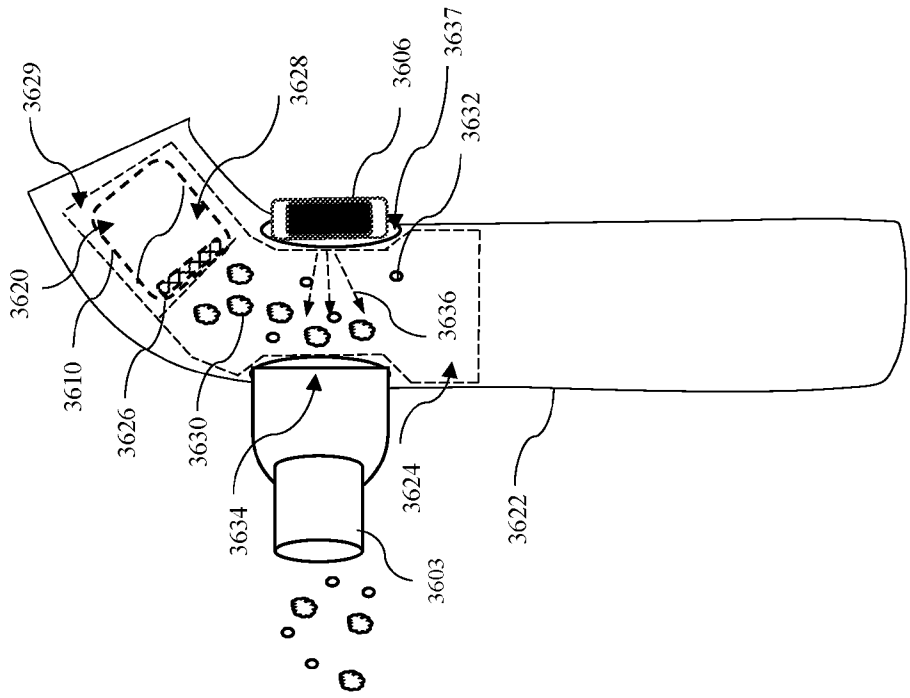

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Fig. 3F

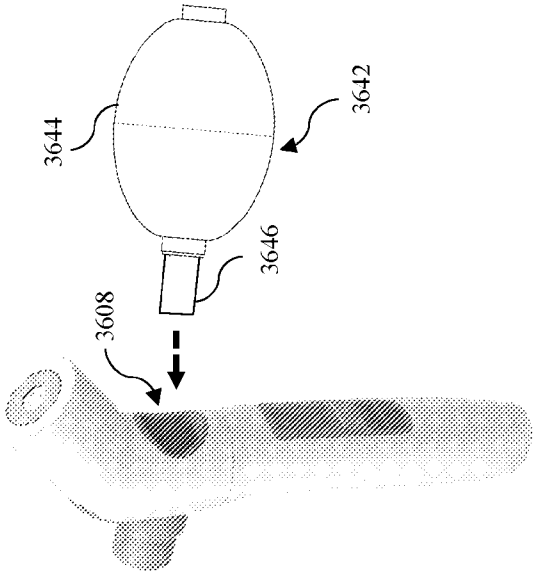


Fig. 3H

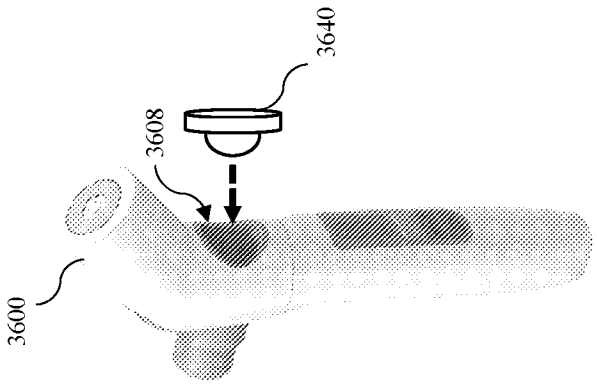


Fig. 3G

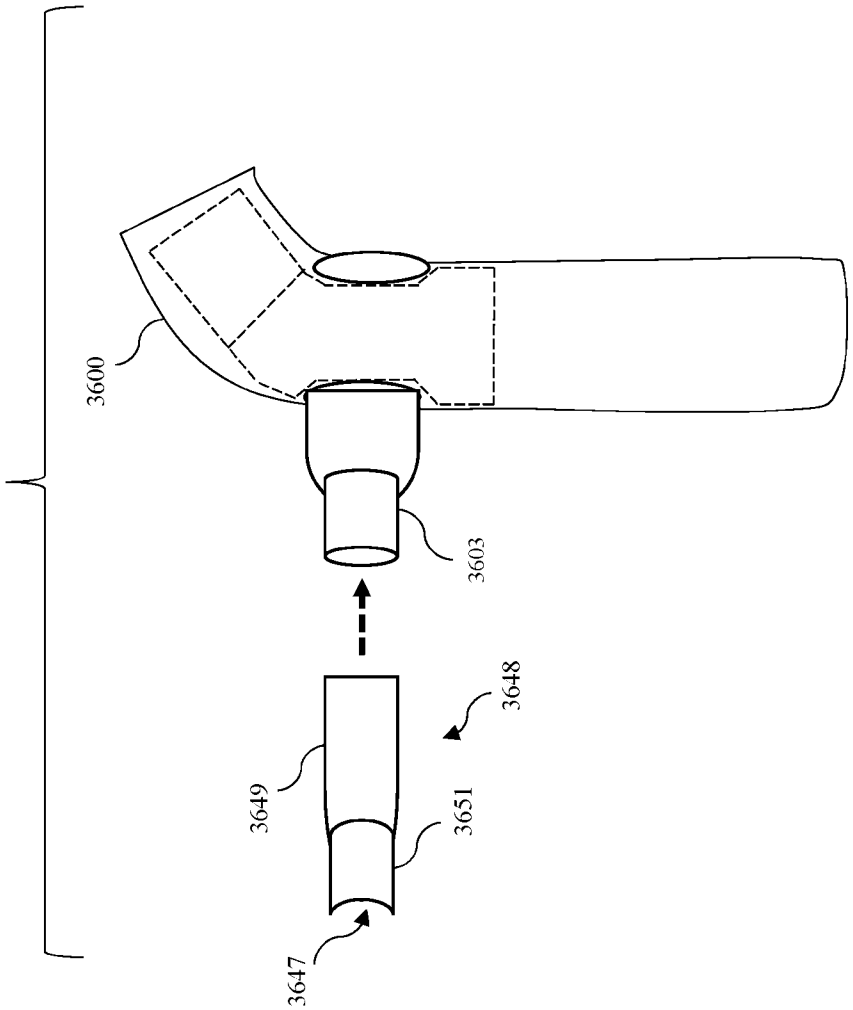


Fig. 3I

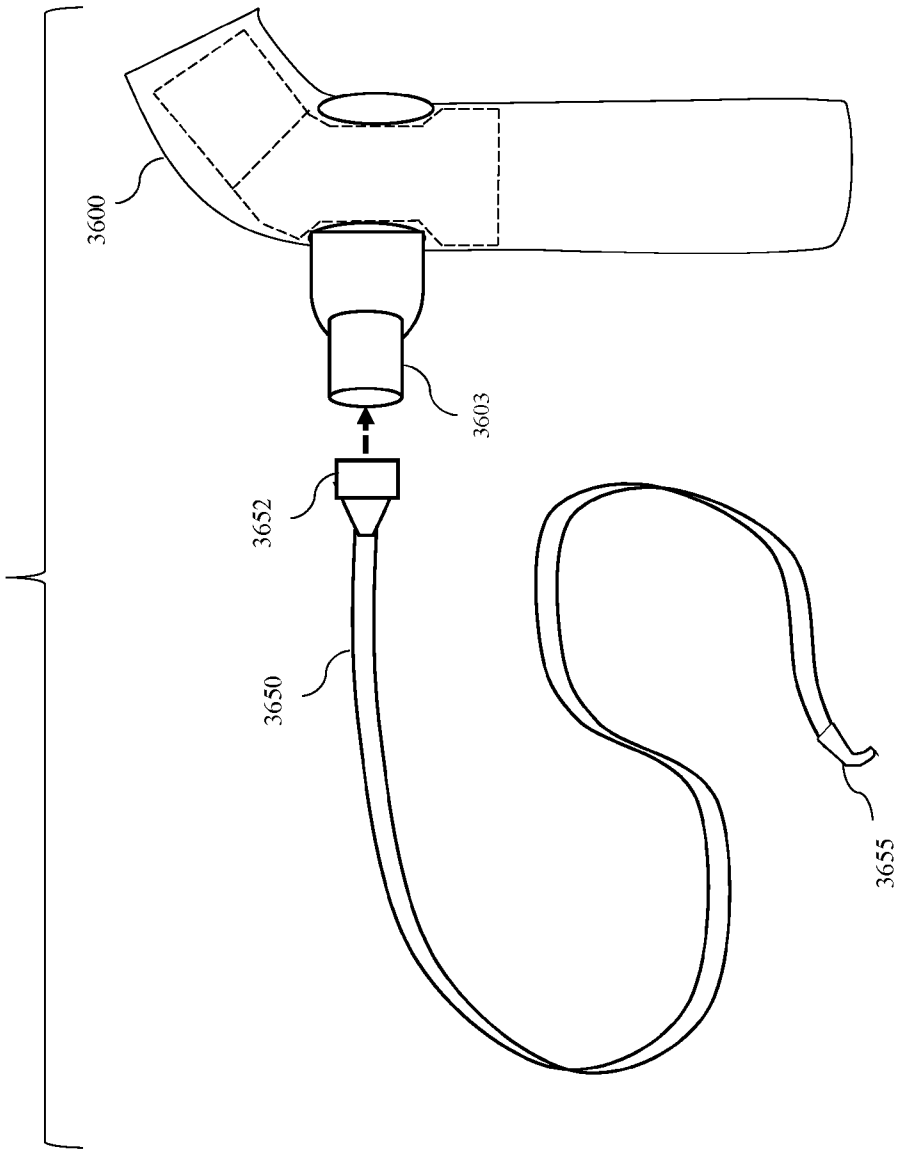


Fig. 3J

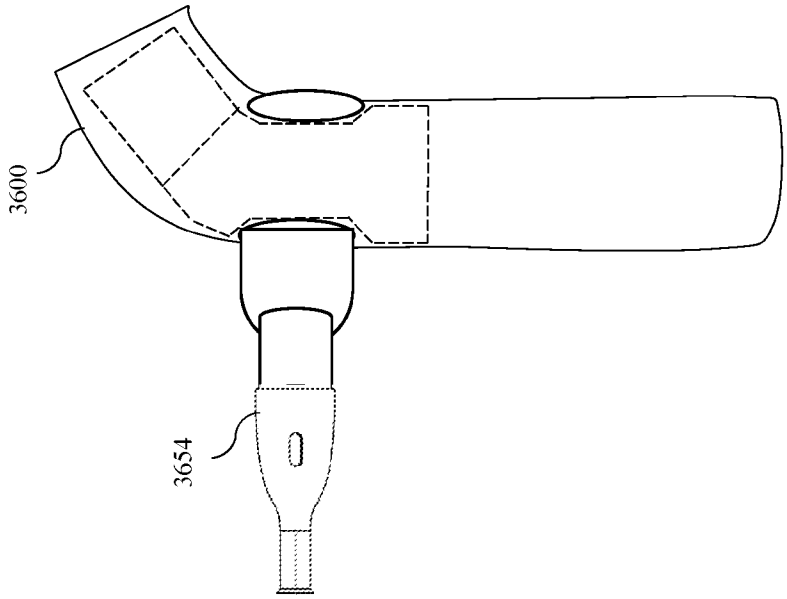


Fig. 3K

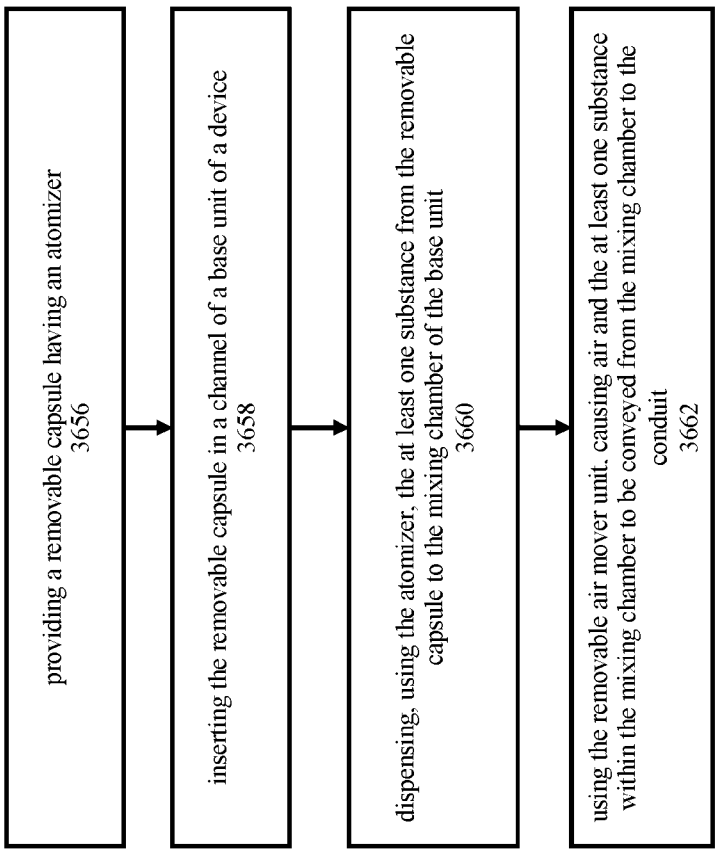

providing a removable capsule having an atomizer
3656
inserting the removable capsule in a channel of a base unit of a device
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dispensing, using the atomizer, the at least one substance from the removable capsule to the mixing chamber of the base unit
3660
using the removable air mover unit, causing air and the at least one substance within the mixing chamber to be conveyed from the mixing chamber to the conduit
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Fig. 3L

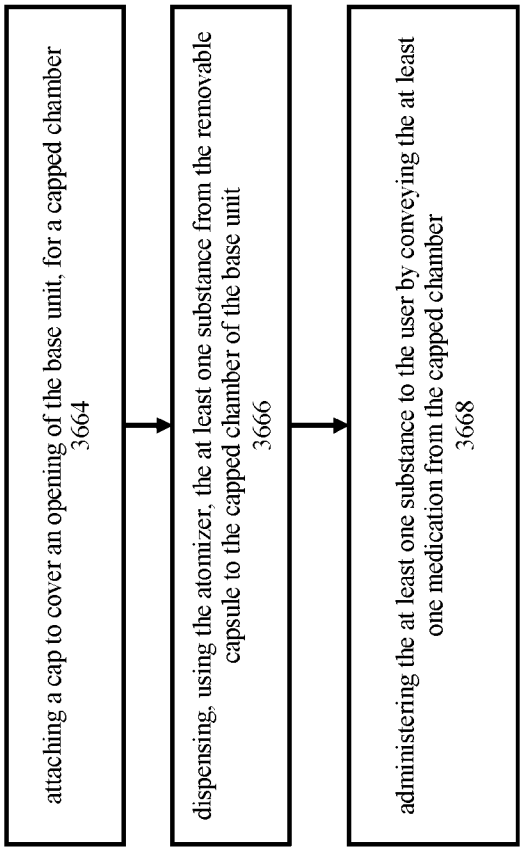

attaching a cap to cover an opening of the base unit, for a capped chamber
3664
dispensing, using the atomizer, the at least one substance from the removable capsule to the capped chamber of the base unit
3666
administering the at least one substance to the user by conveying the at least one medication from the capped chamber
3668

Fig. 3M

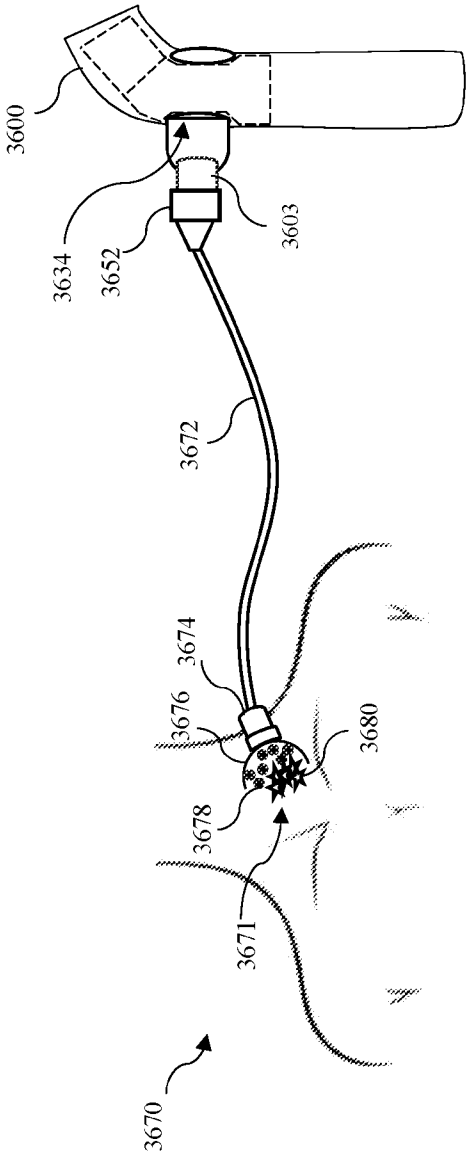


Fig. 3N