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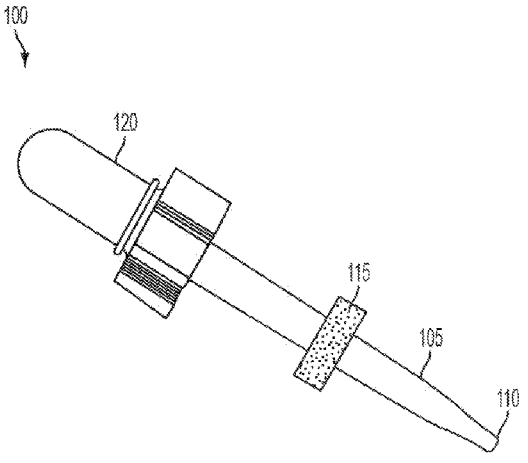


FIG. 1

(57) Abstract: Dispensing units and methods for using dispensing units to apply eye drops to an eye of a user are disclosed. A dispensing unit may include a dispensing barrel having a dispensing orifice and one or more concentric rings. A particular dispensing unit has one concentric ring that is disposed around the circumference of the dispensing barrel and is configured to permit a user to properly visually align the dispensing barrel above an eye of the user. An alternate dispensing unit has first and second rings disposed around a circumference of the dispensing barrel that are configured to permit a user to properly visually align the dispensing barrel above an eye of the user by one or more of color mixing or polarization techniques.

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VISUALLY ALIGNING DISPENSING UNIT

CLAIM OF PRIORITY

[0001] The present application claims the benefit of and priority to U.S. Provisional Application Serial No. 61/612,663, entitled "Visually Aligning Dispensing Unit," which application was filed on March 19, 2012. The aforementioned application is incorporated by reference herein in its entirety and for all purposes.

BACKGROUND

[0002] Conventional dispensing units are imprecise and difficult to properly align with the user's eyeball. As a result, eye drops are frequently improperly delivered. For example, eye drops may land on a user's cheek, eyebrow, or forehead. This can result in frustration for the user, cosmetic attention to remove the improperly delivered eye drops, and wasted fluid. With prescription eye drops in particular, this wasted fluid can affect the deliverable quantity of medicine and effectively raise the unit price of the medicine.

[0003] The above-listed problems may be particularly acute for elderly patients and those with compromised eyesight. A recent study indicated that only 71% of glaucoma patients were able to deliver eye drops into their eye, and only 39% of those patients did so without physically touching the bottle to the surface of the eye. As such, more efficient and practical ways of delivering eye drops would be desirable.

SUMMARY

[0004] This disclosure is not limited to the particular systems, devices and methods described, as these may vary. The terminology used in the description is for the purpose of describing the particular versions or embodiments only, and is not intended to limit the scope.

[0005] As used in this document, the singular forms "a," "an," and "the" include plural references unless the context clearly dictates otherwise. Unless defined otherwise, all

technical and scientific terms used herein have the same meanings as commonly understood by one of ordinary skill in the art. Nothing in this disclosure is to be construed as an admission that the embodiments described in this disclosure are not entitled to antedate such disclosure by virtue of prior invention. As used in this document, the term "comprising" means "including, but not limited to."

[0006] In an embodiment, a dispensing unit may include a dispensing barrel having a dispensing orifice, and one concentric ring disposed around a circumference of the dispensing barrel. The concentric ring is configured to permit a user to properly visually align the dispensing barrel above an eye of the user.

[0007] In an embodiment, a dispensing unit may include a dispensing barrel having a dispensing orifice, and a plurality of concentric rings disposed around a circumference of the dispensing barrel. The plurality of concentric rings may include a first concentric ring and a second concentric ring located proximal to the reservoir as compared to the first concentric ring. The plurality of concentric rings are configured to permit a user to properly visually align the dispensing barrel above an eye of the user.

BRIEF DESCRIPTION OF DRAWINGS

[0008] FIG. 1 depicts a side view of an illustrative dispensing unit having one concentric ring disposed around the circumference of a dispensing barrel according to an embodiment.

[0009] FIG. 2A depicts an illustrative view of the dispensing unit of FIG. 1 from a user's perspective when the dispensing unit is properly aligned.

[0010] FIG. 2B depicts an illustrative view of the dispensing unit of FIG. 1 from a user's perspective when the dispensing unit is misaligned.

[0011] FIG. 3 depicts a side view of an illustrative dispensing unit having two concentric rings disposed around the circumference of a dispensing barrel according to an embodiment.

[0012] FIG. 4A depicts an illustrative view of the dispensing unit of FIG. 3 from a user's perspective when the dispensing unit is properly aligned.

[0013] FIG. 4B depicts an illustrative view of the dispensing unit of FIG. 3 from a user's perspective when the dispensing unit is misaligned.

[0014] FIG. 5 depicts a side view of an illustrative dispensing unit having two concentric polarized rings disposed around the circumference of a dispensing barrel according to an embodiment.

[0015] FIG. 6A depicts an illustrative view of the dispensing unit of FIG. 5 from a user's perspective when the dispensing unit is properly aligned.

[0016] FIG. 6B depicts an illustrative view of the dispensing unit of FIG. 5 from a user's perspective when the dispensing unit is misaligned.

DETAILED DESCRIPTION

[0017] As used herein, the term "dispensing unit" refers to dispensing bottles, single-use eye drop dispensers, eye droppers and/or any other device or portion of a device designed to enable the application of a fluid to the eye.

[0018] The present disclosure describes numerous embodiments for delivering eye drops effectively to a user. As disclosed herein, conventional dispensing units may be modified to be configured with at least one concentric ring located around the circumference of the dispensing unit barrel (i.e., the barrel of the syringe) to aid in proper alignment of the barrel to the user's eye. Single or double colored rings may be used. For example, two differently colored rings may be used and appear as a third "new" colored single ring when

the dispensing unit is properly aligned. Alternatively, two transparent rings having different optical polarizations may appear as a single opaque ring when properly aligned, but would appear as transparent rings when misaligned. In some embodiments, the transparent rings are colorless, while the opaque ring is black.

[0019] FIG. 1 depicts a side view of an illustrative dispensing unit having one concentric ring disposed around the circumference of a dispensing barrel according to an embodiment. As shown in FIG. 1, a dispensing unit **100** may include a dispensing barrel **105** having a dispensing orifice **110**. The dispensing orifice **110** may be located at an end of the dispensing barrel **105** that is configured to be proximal to the user's eye during application of eye drops.

[0020] The dispensing unit **100** may further include one concentric ring **115** located around the circumference of the dispensing barrel **105**. The concentric ring **115** may be located at a position on the dispensing barrel **105** that is distal from the dispensing orifice **110**. In an embodiment, the concentric ring **115** may also be located at a position on the dispensing barrel **105** that is proximal from a reservoir **120** of the dispensing unit **100**. For example, the concentric ring **115** may be placed at or around a midpoint of the dispensing barrel **105**. Alternate positions for the concentric ring **115** may also be used within the scope of this disclosure.

[0021] In an embodiment, the concentric ring **115** may be translucent. In an alternate embodiment, the concentric ring **115** may be transparent. In yet another embodiment, the concentric ring **115** may be opaque.

[0022] The concentric ring **115** can generally be made of any material. Example materials include glass, plastic, polycarbonate, polypropylene, polyethylene, polyacrylate, and the like. The diameter of the ring **115** will vary in some ways according to the diameter of the dispensing barrel **105**. A larger barrel diameter will lead to a larger ring diameter. In

an embodiment, the ring **115** may be formed separately from the barrel and attached, adhered or otherwise positioned around the dispensing barrel **105**. In an alternate embodiment, the ring **115** may be co-molded as an extension of the dispensing barrel **105**.

[0023] The reservoir **120** of the dispensing unit **100** may be located at an end of the dispensing barrel **105** that is opposite to the dispensing orifice **110**. The reservoir **120** may be an elastomeric bulb that is fitted to an end of the dispensing barrel **105** opposite to the dispensing orifice **110**. The elastomeric bulb may be made of rubber, latex, or other elastomeric materials. When in use, the elastomeric bulb may first be compressed and the dispensing orifice **110** immersed into a volume of eye drop liquid. As the bulb decompresses, the eye drop liquid is drawn through the dispensing barrel **105** toward the reservoir **120**. The dispensing unit **100** may be removed from the liquid, and the bulb can then be compressed again to dispense the eye drops through the dispensing orifice **110**.

[0024] In an embodiment, the concentric ring **115** may be formed separately from the reservoir **120** and attached or adhered to the reservoir. In an alternate embodiment, the concentric ring **115** may be co-molded as part of the reservoir **120**. In another embodiment, the reservoir **120** or the elastomeric bulb may include a flange that surrounds the dispensing barrel **105** with a uniform thickness to form a second larger concentric ring in addition to the concentric ring **115**. The second larger concentric ring may have a diameter that is larger than that of the concentric ring **115**. In an embodiment, the flange or the second larger concentric ring may be formed separately from the reservoir **120** and attached or adhered to the reservoir **120**. In an alternate embodiment, the flange or the second larger concentric ring may be co-molded as part of the reservoir **120**.

[0025] In an embodiment, the concentric ring **115** may have a color that differs from a color of the dispensing barrel **105**. For example, the dispensing barrel **105** may be formed of a clear plastic while the concentric ring **115** may be one of black, red, green, or any other

discernible color. The difference in color between the concentric ring **115** and the dispensing barrel **105** may enable a user to more readily discern the alignment of the concentric ring with respect to the dispensing barrel during a dispensing operation. Alternate colors for the dispensing barrel **105** and concentric ring **115** may be used within the scope of this disclosure.

[0026] In an embodiment, the concentric ring **115** may have a color that differs from a color of the reservoir **120**. For example, the concentric ring **115** may be of a color that is discernible from the color of the flange or the second larger concentric ring. The concentric ring **115** may be attached to the flange or the second larger concentric ring, or may be located at a position on the dispensing barrel **105** that is proximal from the reservoir **120** of the dispensing unit **100**. The concentric ring **115** may surround the dispensing barrel **105** with a uniform thickness that is smaller than that of the second larger concentric ring. Accordingly, the concentric ring **115** and the second larger concentric ring may surround the dispensing barrel **105** in a concentric manner, such that the concentric ring **115** forms an inner annular ring within a larger annular ring formed by the second larger concentric ring. The difference in color between the concentric ring **115** and the second larger concentric ring may enable a user to more readily discern the alignment of both rings with respect to the dispensing barrel **105** during a dispensing operation.

[0027] The concentric ring **115** may be configured to permit a user to properly visually align the dispensing barrel **105** during a dispensing operation. The user can easily and visually distinguish between a properly aligned dispensing barrel **105** and an improperly aligned dispensing barrel **105** that would more likely result in an inaccurately delivered eye drop. In an embodiment, proper alignment of the dispensing unit **100** may be achieved when the concentric ring **115** is completely visible to a user during a dispensing operation. For example, when the dispensing unit **100** is properly aligned with the eye, the concentric ring

115 may appear to completely surround the dispensing barrel **105** from the point of view of the user, such as is shown in FIG. 2A. In contrast, misalignment of the dispensing unit **100** may occur when the concentric ring **115** is not completely visible to the user. For example, when misaligned, the concentric ring **115** may only be visible around a portion of the dispensing barrel **105** from the point of view of the user, such as is shown in FIG. 2B.

[0028] The concentric ring **115** and the flange of the elastomeric bulb of the reservoir **120** may be also configured to permit a user to properly visually align the dispensing barrel **105** during a dispensing operation. In an embodiment, proper alignment of the dispensing unit **100** may be achieved when both the concentric ring **115**, and an outer ring surrounding the concentric ring **115** formed by a portion of the flange not overlapping with the concentric ring **115**, are completely visible to a user during a dispensing operation. For example, when the dispensing unit **100** is properly aligned with the eye, the concentric ring **115** may appear to completely surround the dispensing barrel **105**, and the outer ring formed by the flange may completely surround the concentric ring **115**, from the point of view of the user. In contrast, misalignment of the dispensing unit may occur when the concentric ring **115** and the outer ring surrounding the concentric ring **115** formed by the flange are not completely visible to the user. For example, when misaligned, the concentric ring **115** and the outer ring may only be visible around a portion of the dispensing barrel **105**, from the point of view of the user.

[0029] FIG. 3 depicts a side view of an illustrative dispensing unit having two concentric rings disposed around the circumference of a dispensing barrel according to an embodiment. As shown in FIG. 3, a dispensing unit **300** may include a dispensing barrel **305** having a dispensing orifice **310**. The dispensing orifice **310** may be located at an end of the dispensing barrel **305** that is configured to be proximal to the user's eye during application of eye drops.

[0030] The dispensing unit **300** may further include a plurality of concentric rings, such as a first concentric ring **315** and a second concentric ring **320**, located around the circumference of the dispensing barrel **305**. The concentric rings **315** and **320** may be located at positions on the dispensing barrel **305** that are distal from the dispensing orifice **310**. In an embodiment, the concentric rings **315** and **320** may also be located at positions on the dispensing barrel **305** that are proximal from a reservoir **325** of the dispensing unit **300**. In an embodiment, the first concentric ring **315** may be positioned closer to the dispensing orifice **310** than the second concentric ring **320**. Alternate positions for the first and second concentric rings **315** and **320** may also be used within the scope of this disclosure.

[0031] In an embodiment, the first concentric ring **315** may be translucent. In an alternate embodiment, the first concentric ring **315** may be transparent. In an embodiment, the second concentric ring **320** may be translucent. In an alternate embodiment, the second concentric ring **320** may be transparent. In yet another embodiment, the second concentric ring **320** may be opaque.

[0032] The first and second concentric rings **315**, **320** can generally be made of any material. Example materials include glass, plastic, polycarbonate, polypropylene, polyethylene, polyacrylate, and the like. The diameter of the rings **315**, **320** will vary in some ways according to the diameter of the dispensing barrel **305**. A larger barrel diameter will lead to a larger ring diameter. In an embodiment, the rings **315**, **320** may be formed separately from the barrel and attached, adhered or otherwise positioned around the dispensing barrel **305**. In an alternate embodiment, the rings **315**, **320** may be co-molded as an extension of the dispensing barrel **305**.

[0033] The first and second concentric rings **315**, **320** can have the same or different diameters from each other. In some embodiments, the first concentric ring **315** may have a

smaller diameter than, substantially a same diameter as, or a larger diameter than the second concentric ring **320**.

[0034] In an embodiment, the first concentric ring **315** may have a first color, and the second concentric ring **320** may have a second color that differs from the first color. For example, the first concentric ring **315** may be red, and the second concentric ring **320** may be blue. Alternate and/or additional colors may be used for the first and second concentric rings **315** and **320** within the scope of this disclosure.

[0035] The first and second concentric rings **315** and **320** may be configured to permit a user to properly visually align the dispensing barrel **305** during a dispensing operation. The user can easily and visually distinguish between a properly aligned dispensing barrel **305** and an improperly aligned dispensing barrel **305** that would more likely result in an inaccurately delivered eye drop. In an embodiment, proper alignment of the dispensing unit **300** may be achieved when the first and second concentric rings **315** and **320** overlap such that a third color that results from the combination of the first color and the second color is displayed to a user. For example, when the dispensing unit **300** is properly aligned with the eye, if the first concentric ring **315** is red and the second concentric ring **320** is blue, a purple ring may appear to completely surround the dispensing barrel **305** from the point of view of the user, such as is shown in FIG. 4A. In contrast, misalignment of the dispensing unit **300** may occur when the colors of one or more of the first concentric ring **315** and the second concentric ring **320** are visible. For example, when misaligned, the color of the first concentric ring **315** and the color of the second concentric ring **320** may both be visible around a portion of the dispensing barrel **305** from the point of view of the user, such as is shown in FIG. 4B.

[0036] Where the first concentric ring **315** having a first color, and the second concentric ring **320** having a second color, are of different diameters, for example, where the

first concentric ring **315** has a smaller diameter than the second concentric ring **320**, proper alignment of the dispensing unit **300** may be achieved when an overlapping portion of the first concentric ring **315** with the second concentric ring **320** shows a third colored ring within the larger second concentric ring **320**. For example, when the dispensing unit **300** is properly aligned with the eye, if the first concentric ring **315** is red and the second concentric ring **320** is blue, a purple ring within a blue ring may appear to completely surround the dispensing barrel **305** from the point of view of the user. Likewise, where the first concentric ring **315** has a larger diameter than the second concentric ring **320**, proper alignment of the dispensing unit **300** may be achieved when an overlapping portion of the first concentric ring **315** with the second concentric ring **320** shows a third colored ring within the larger first concentric ring **315**. For example, when the dispensing unit **300** is properly aligned with the eye, if the first concentric ring **315** is red and the second concentric ring **320** is blue, a purple ring within a red ring may appear to completely surround the dispensing barrel **305** from the point of view of the user.

[0037] In contrast, misalignment of the dispensing unit **300** may occur when the purple ring is not completely visible to the user. For example, when misaligned, the purple ring may only be visible around a portion of the dispensing barrel from the point of view of the user.

[0038] FIG. 5 depicts a side view of an illustrative dispensing unit having two concentric polarized rings disposed around the circumference of a dispensing barrel according to an embodiment. As shown in FIG. 5, a dispensing unit **500** may include a dispensing barrel **505** having a dispensing orifice **510**. The dispensing orifice **510** may be located at an end of the dispensing barrel **505** that is configured to be proximal to the user's eye during application of eye drops.

[0039] The dispensing unit **500** may further include a plurality of concentric rings, such as a first concentric ring **515** and a second concentric ring **520**, located around the circumference of the dispensing barrel **505**. The concentric rings **515** and **520** may be located at positions on the dispensing barrel **505** that are distal from the dispensing orifice **510**. In an embodiment, the concentric rings **515** and **520** may also be located at positions on the dispensing barrel **505** that are proximal from a reservoir **525** of the dispensing unit **500**. Alternate positions for the first and second concentric rings **515** and **520** may also be used within the scope of this disclosure. The first and second concentric rings **515** and **520** may generally be placed at any distance from each other along the dispensing barrel **505**.

[0040] In an embodiment, the first concentric ring **515** may be translucent. In an alternate embodiment, the first concentric ring **515** may be transparent. In an embodiment, the second concentric ring **520** may be translucent. In an alternate embodiment, the second concentric ring **520** may be transparent. In an embodiment, each of the first concentric ring **515** and the second concentric ring **520** may a different optical polarization.

[0041] The first and second concentric rings **515**, **520** can generally be made of any material. Example materials include glass, plastic, polycarbonate, polypropylene, polyethylene, polyacrylate, and the like. The diameter of the rings **515**, **520** will vary in some ways according to the diameter of the dispensing barrel **505**. A larger barrel diameter will lead to a larger ring diameter. In an embodiment, the rings **515**, **520** may be formed separately from the barrel and attached, adhered or otherwise positioned around the dispensing barrel **505**. In an alternate embodiment, the rings **515**, **520** may be co-molded as an extension of the dispensing barrel **505**.

[0042] The first concentric ring **515** and the second concentric ring **520** can have the same or different diameters from each other. In some embodiments, the first concentric ring

515 may have a smaller diameter than, substantially a same diameter as, or a larger diameter than the second concentric ring **520**.

[0043] The first and second concentric rings **515** and **520** may be configured to permit a user to properly visually align the dispensing barrel **505** during a dispensing operation. The user can easily and visually distinguish between a properly aligned dispensing barrel **505** and an improperly aligned dispensing barrel **505** that would more likely result in an inaccurately delivered eye drop. In an embodiment, proper alignment of the dispensing unit **500** may be achieved when the first and second concentric rings **515** and **520** overlap such that the different polarizations cancel each other. For example, when the dispensing unit **500** is properly aligned with the eye, the polarizations of the first concentric ring **515** and the second concentric ring **520** may cancel each other such that a single black opaque ring may appear to completely surround the dispensing barrel **505** from the point of view of the user, such as is shown in FIG. 6A. In contrast, misalignment of the dispensing unit **500** may occur when the black ring is not visible to the user. For example, when misaligned, the black ring caused by the polarizations of the first and second concentric rings **515** and **520** may either not be visible around at least a portion of the dispensing barrel **505** from the point of view of the user, such as is shown in FIG. 6B.

[0044] Where the first concentric ring **515** having a first optical polarization, and the second concentric ring **520** having a second optical polarization, are of different diameters, for example, where the first concentric ring **515** has a smaller diameter than the second concentric ring **520**, proper alignment of the dispensing unit **500** may be achieved when an overlapping portion of the first concentric ring **515** with the second concentric ring **520** shows a third ring within the larger second concentric ring **520** resulting from the cancellation of the different optical polarizations. For example, when the dispensing unit **500** is properly aligned with the eye, the polarizations of the first concentric ring **515** and the overlapped

portion of the second concentric ring **520** may cancel each other such that a single black opaque ring within the larger second concentric ring **520** may appear to completely surround the dispensing barrel **505** from the point of view of the user. Likewise, where the first concentric ring **515** has a larger diameter than the second concentric ring **520**, proper alignment of the dispensing unit **500** may be achieved when an overlapping portion of the first concentric ring **515** with the second concentric ring **520** shows a third colored ring within the larger first concentric ring **515**. For example, when the dispensing unit **500** is properly aligned with the eye, the polarizations of the second concentric ring **520** and the overlapped portion of the first concentric ring **515** may cancel each other such that a single black opaque ring within the larger first concentric ring **515** may appear to completely surround the dispensing barrel **505** from the point of view of the user. In contrast, misalignment of the dispensing unit **500** may occur when the black ring is not completely visible to the user.

[0045] A method of using the dispensing unit as described in the disclosed embodiments may include placing the dispensing unit above the eye of a user in a dispensing configuration. The dispensing configuration may include having the dispensing barrel disposed towards the eye of the user, and aligning the dispensing unit so that the one or more concentric rings described in the disclosed embodiments may provide a visual indication of alignment above the eye of the user. The visual indication of alignment may be as described in the embodiments disclosed herein. Once the visual indication of alignment is obtained, the user may dispense one or more eye drops from the dispensing unit to the eye.

[0046] The eye drops or eye drop liquid as referred to herein may include water, saline solution, eye lubricants, or an ophthalmic medication configured for topical administration the eye. The number of drops to be dispensed or dosage of the eye drops will be dependent on the eye condition or the prescription by the doctor.

EXAMPLES

Example 1: Dispensing Unit Having Single Colored Ring

[0047] A dispensing unit having a single black ring surrounding the dispensing barrel of the dispensing unit is provided. The single black ring has a uniform outer diameter and is positioned between a plunger of the dispensing unit and a dispensing orifice. When properly positioned over a user's eye, the single black ring appears to completely surround the dispensing orifice and the dispensing barrel with a uniform thickness. Proper placement occurs when the dispensing unit is held directly above the recipient's eye with the user's head tilted backwards or with the user in a reclined position.

Example 2: Dispensing Unit Having Multiple Colored Rings

[0048] A dispensing unit having a first and second ring surrounding the dispensing barrel of the dispensing unit is provided. The first ring has a uniform outer diameter and is positioned between a dispensing orifice and the second ring. The second ring has a uniform outer diameter and is positioned between the first ring and a plunger of the dispensing unit. The first ring is transparent and is tinted a first primary color, such as blue. The second ring is tinted a second primary color, such as red. When properly positioned over a user's eye, the first and second rings overlap from the point of view of the user causing the first primary color and the second primary color to combine into a secondary color, such as purple in this example. This purple "ring" appears to completely surround the dispensing orifice and the dispensing barrel with a uniform thickness. Proper placement occurs when the dispensing unit is held directly above the recipient's eye with the user's head tilted backwards or with the user in a reclined position.

Example 3: Dispensing Unit Having Multiple Polarized Rings

[0049] A dispensing unit having a first and second ring surrounding the dispensing barrel of the dispensing unit is provided. The first ring has a uniform outer diameter and is positioned between a dispensing orifice and the second ring. The second ring has a uniform outer diameter and is positioned between the first ring and a plunger of the dispensing unit. The first ring is translucent and has a first polarization. The second ring has a second polarization that differs from the first polarization. When properly positioned over a user's eye, the first and second rings overlap from the point of view of the user. As a result, light cannot pass through both the first and second polarized rings. This causes a black "ring" to appear to completely surround the dispensing orifice and the dispensing barrel with a uniform thickness. Proper placement occurs when the dispensing unit is held directly above the recipient's eye with the user's head tilted backwards or with the user in a reclined position.

Example 4: Delivery of Eye Drop Using Dispensing Unit Having One Ring

[0050] A user reclines in a prone position and places the dispensing unit above the eye into which the eye drops are to be placed. The dispensing unit includes a dispensing barrel and a concentric ring. The dispensing unit is placed in a dispensing configuration (i.e., such that the dispensing unit has a dispensing barrel disposed towards the eye of the user). The dispensing unit is aligned by the user so that the concentric ring provides a visual indication of alignment above the user's eye. Specifically, the visual indication is achieved by having the concentric ring completely visible to the user. One or more eye drops are then dispensed from the dispensing unit to the eye of the user. The exact dosage may be prescribed by a doctor or printed on the dispensing unit or packaging associated with the dispensing unit. Using this method it is expected that a more accurate delivery of the eye drops to the eye of the user is achieved that with conventional eyedroppers.

Example 5: Delivery of Eye Drop Using Dispensing Unit Having Multiple Colored Rings

[0051] A user reclines in a prone position and places the dispensing unit above the eye into which the eye drops are to be placed. The dispensing unit includes a dispensing barrel, a red concentric ring and a blue concentric ring. The dispensing unit is placed in a dispensing configuration (i.e., such that the dispensing unit has a dispensing barrel disposed towards the eye of the user). The dispensing unit is aligned by the user so that the red and blue concentric rings appear to produce a single purple ring from the perspective of the user. One or more eye drops are then dispensed from the dispensing unit to the eye of the user. The exact dosage may be prescribed by a doctor or printed on the dispensing unit or packaging associated with the dispensing unit. Using this method it is expected that a more accurate delivery of the eye drops to the eye of the user is achieved that with conventional eyedroppers.

Example 6: Delivery of Eye Drop Using Dispensing Unit Having Multiple Polarized Rings

[0052] A user reclines in a prone position and places the dispensing unit above the eye into which the eye drops are to be placed. The dispensing unit includes a dispensing barrel and two concentric rings having different polarizations. The dispensing unit is placed in a dispensing configuration (i.e., such that the dispensing unit has a dispensing barrel disposed towards the eye of the user). The dispensing unit is aligned by the user so that the concentric rings appear to produce a single black ring from the perspective of the user. One or more eye drops are then dispensed from the dispensing unit to the eye of the user. The exact dosage may be prescribed by a doctor or printed on the dispensing unit or packaging associated with the dispensing unit. Using this method it is expected that a more accurate

delivery of the eye drops to the eye of the user is achieved that with conventional eyedroppers.

Example 7: Dispensing Unit Having a Single Colored Ring Attached to a Plunger of the Dispensing Unit

[0053] A dispensing unit is provided having a single black ring surrounding a dispensing barrel. The dispensing barrel has a plunger at one end and a dispensing orifice an opposite end. The plunger is an elastomeric bulb having a flange that surrounds the dispensing barrel with a first uniform thickness. The bulb with the flange is red in color. The single black ring surrounding the dispensing barrel is attached to the flange, and is positioned between the plunger and the dispensing orifice. The single black ring surrounds the dispensing barrel with a second uniform thickness that is smaller than the first uniform thickness. The single black ring is adhered to the flange of the elastomeric bulb such that the flange and the black ring surrounds the dispensing barrel in a concentric manner. Accordingly, the single black ring will form an inner annular ring within a larger red annular ring formed by the red flange. When the dispensing unit is properly aligned over a user's eye, a full black ring that appears to completely surround the dispensing barrel with uniform thickness, and a full red ring that appears to completely surround the black ring with uniform thickness, will be visible from the point of view of the user. In contrast, when the dispensing unit is not properly aligned, the full black ring and the full red ring will not be completely visible from the point of view of the user. For example, the black and red rings will only be visible around a portion of the dispensing barrel, or both rings will not appear to have a uniform thickness around the dispensing barrel.

Example 8: Delivery of Eye Drop Using Dispensing Unit Having a Single Colored Ring Attached to a Plunger of the Dispensing Unit

[0054] A user reclines in a prone position and places the dispensing unit of Example 7 above the eye into which the eye drops are to be placed. The alignment of the dispensing unit is adjusted by the user until a full black ring that appears to completely surround the dispensing barrel with uniform thickness, and a full red ring that appears to completely surround the black ring with uniform thickness, are visible from the point of view of the user. This provides a visual indication to the user that the dispensing unit is properly aligned. One or more eye drops are then dispensed from the dispensing unit to the eye of the user. Using this method, it is expected that a more accurate delivery of the eye drops to the eye of the user is achieved than can be achieved using conventional eyedroppers.

Example 9: Prototype of a Dispensing Unit Having a Single Colored Ring

[0055] A dispensing unit having a single blue ring disposed around a circumference of a dispensing barrel was manufactured. The dispensing barrel had a plunger at one end and a dispensing orifice at an opposite end. The blue ring was positioned between the plunger and the dispensing orifice. The dispensing barrel and the dispensing orifice formed an integral structure made of a 20 ml capillary glass tube having a portion that tapered toward the dispensing orifice. The glass tube had a length of 100 mm, with the tapering portion forming about 25 mm of the length. The diameter of the glass tube was 7 mm, which tapered along the tapering portion to 1.5 mm at the dispensing orifice. The plunger was made of a latex bulb fitted to the glass tube at an opposite end from the dispensing orifice. When in use, the latex bulb contained a reservoir of eye drop liquid which can be dispensed when the bulb is compressed. The blue ring was made of polyacrylate that was tinted blue, and was transparent. The blue ring was laser cut to size, and surrounded the glass tube with a uniform

thickness of 6 mm. The blue ring had an outer diameter of 19 mm, and an inner diameter of 7 mm. The blue ring was positioned along the glass tube at about 70 mm from the dispensing orifice. Loctite® 4011™ adhesive (Henkel Corporation; Rocky Hill, CT 06067, USA) was applied to the interface between the blue ring and the glass tube to affix the blue ring to the glass tube. The dispensing unit was used by a user who was in a reclined position. When the dispensing unit was properly aligned over the user's eye, a full single blue ring that appeared to completely surround the dispensing barrel with a uniform thickness, was visible from the point of view of the user. In contrast, when the dispensing unit was not properly aligned, the full single blue ring was not completely visible from the point of view of the user. For example, the blue ring was only visible around a portion of the dispensing barrel, or the blue ring did not appear to have a uniform width around the dispensing barrel.

Example 10: Prototype of a Dispensing Unit Having Multiple Colored Rings

[0056] A dispensing unit having a first yellow ring and a second blue ring disposed around a circumference of a dispensing barrel was manufactured. The dispensing barrel had a plunger at one end and a dispensing orifice at an opposite end. The first yellow ring was positioned between the dispensing orifice and the second blue ring. The second blue ring was positioned between the plunger and the first yellow ring. The dispensing barrel and the dispensing orifice formed an integral structure made of a 20 ml capillary glass tube having a portion that tapered toward the dispensing orifice. The glass tube had a length of 100 mm, with the tapering portion forming 25 mm of the length. The diameter of the glass tube was 7 mm, which tapered along the tapering portion to 1.5 mm at the dispensing orifice. The plunger was made of a latex bulb fitted to the glass tube at an opposite end from the dispensing orifice. When in use, the latex bulb contained a reservoir of eye drop liquid which can be dispensed when the bulb is compressed. The first ring was made of yellow tinted

polyacrylate, and the second ring was made of blue tinted polyacrylate. Both the yellow and blue rings were transparent. Each of the yellow ring and the blue ring was laser cut to size, and surrounded the glass tube with a uniform thickness of 6 mm. Both the yellow ring and the blue ring had an outer diameter of 19 mm, and an inner diameter of 7 mm. The yellow ring was positioned along the glass tube at about 50 mm from the dispensing orifice, and the blue ring was positioned along the glass tube at about 70 mm from the dispensing orifice. Loctite® 4011™ adhesive (Henkel Corporation; Rocky Hill, CT 06067, USA) was applied to the interface between each of the yellow and blue rings and the glass tube to affix both rings to the glass tube. The dispensing unit was used by a user who was in a reclined position. When the dispensing unit was properly aligned over the user's eye, a full single "green" ring that appeared to completely surround the dispensing barrel with a uniform thickness, was visible from the point of view of the user. The "green" ring was a result of the first yellow ring and the second blue ring overlapping from the point of view of the user causing the two colors to combine into a new third color, green. In contrast, when the dispensing unit was not properly aligned, the yellow color of the first yellow ring, the blue color of the second blue ring, and a green region resulting from a partial overlap between the two colors, were visible around a portion of the dispensing barrel from the point of view of the user.

Example 11: Delivery of Eye Drop Using a Conventional Eye Dropper

[0057] A conventional eye dropper having a similar configuration as Example 9 and Example 10 was provided, but without the colored ring or rings. In a reclined position, a user had placed the conventional eye dropper over an eye, and adjusted the eye dropper until the dispensing orifice appeared to be above the eye from the point of view of the user. About three drops of the eye drop liquid were then dispensed from the conventional eye dropper. It

was observed that two out of the three drops of the eye drop liquid had missed the eye, resulting in wastage of the eye drop liquid.

Example 12: Delivery of Eye Drop Using the Prototype from Example 9

[0058] A user had used the dispensing unit from Example 9 in a reclined position. The dispensing unit was placed above an eye of the user, and the alignment of the dispensing unit was adjusted until the user saw a blue ring that surrounded the dispensing orifice and the dispensing barrel with a uniform thickness, and the blue ring was completely visible to the user. This was a visual indication to the user that the dispensing unit was properly aligned. About three drops of the eye drop liquid were then dispensed from the dispensing unit to the eye of the user when the user compressed the latex bulb. It was observed that all three drops of the eye drop liquid were delivered to the eye and none of the drops had missed the eye. It will therefore be appreciated that the dispensing unit having a single colored ring disposed around a circumference of the dispensing barrel as described in the embodiments disclosed herein, had provided better accuracy in delivering eye drop liquid to the eye than the conventional eye dropper.

Example 13: Delivery of Eye Drop Using the Prototype from Example 10

[0059] A user had used the dispensing unit from Example 10 in a reclined position. The dispensing unit was placed above an eye of the user, and the alignment of the dispensing unit was adjusted until the user saw a complete "green" ring that surrounded the dispensing orifice and the dispensing barrel with a uniform thickness. This was a visual indication to the user that the dispensing unit was properly aligned. About three drops of the eye drop liquid were then dispensed from the dispensing unit to the eye of the user when the user compressed the latex bulb. It was observed that all three drops of the eye drop liquid were delivered to

the eye and none of the drops had missed the eye. It will therefore be appreciated that the dispensing unit having multiple colored rings disposed around a circumference of the dispensing barrel as described in the embodiments disclosed herein, had provided better accuracy in delivering eye drop liquid to the eye than the conventional eye dropper.

[0060] In the above detailed description, reference is made to the accompanying drawings, which form a part hereof. In the drawings, similar symbols typically identify similar components, unless context dictates otherwise. The illustrative embodiments described in the detailed description, drawings, and claims are not meant to be limiting. Other embodiments may be used, and other changes may be made, without departing from the spirit or scope of the subject matter presented herein. It will be readily understood that the aspects of the present disclosure, as generally described herein, and illustrated in the Figures, can be arranged, substituted, combined, separated, and designed in a wide variety of different configurations, all of which are explicitly contemplated herein.

[0061] The present disclosure is not to be limited in terms of the particular embodiments described in this application, which are intended as illustrations of various aspects. Many modifications and variations can be made without departing from its spirit and scope, as will be apparent to those skilled in the art. Functionally equivalent methods and apparatuses within the scope of the disclosure, in addition to those enumerated herein, will be apparent to those skilled in the art from the foregoing descriptions. Such modifications and variations are intended to fall within the scope of the appended claims. The present disclosure is to be limited only by the terms of the appended claims, along with the full scope of equivalents to which such claims are entitled. It is to be understood that this disclosure is not limited to particular methods, reagents, compounds, compositions or biological systems,

which can, of course, vary. It is also to be understood that the terminology used herein is for the purpose of describing particular embodiments only, and is not intended to be limiting.

[0062] With respect to the use of substantially any plural and/or singular terms herein, those having skill in the art can translate from the plural to the singular and/or from the singular to the plural as is appropriate to the context and/or application. The various singular/plural permutations may be expressly set forth herein for sake of clarity.

[0063] It will be understood by those within the art that, in general, terms used herein, and especially in the appended claims (*e.g.*, bodies of the appended claims) are generally intended as "open" terms (*e.g.*, the term "including" should be interpreted as "including but not limited to," the term "having" should be interpreted as "having at least," the term "includes" should be interpreted as "includes but is not limited to," etc.). While various compositions, methods, and devices are described in terms of "comprising" various components or steps (interpreted as meaning "including, but not limited to"), the compositions, methods, and devices can also "consist essentially of" or "consist of" the various components and steps, and such terminology should be interpreted as defining essentially closed-member groups. It will be further understood by those within the art that if a specific number of an introduced claim recitation is intended, such an intent will be explicitly recited in the claim, and in the absence of such recitation no such intent is present. For example, as an aid to understanding, the following appended claims may contain usage of the introductory phrases "at least one" and "one or more" to introduce claim recitations. However, the use of such phrases should not be construed to imply that the introduction of a claim recitation by the indefinite articles "a" or "an" limits any particular claim containing such introduced claim recitation to embodiments containing only one such recitation, even when the same claim includes the introductory phrases "one or more" or "at least one" and indefinite articles such as "a" or "an" (*e.g.*, "a" and/or "an" should be interpreted to mean "at

least one" or "one or more"); the same holds true for the use of definite articles used to introduce claim recitations. In addition, even if a specific number of an introduced claim recitation is explicitly recited, those skilled in the art will recognize that such recitation should be interpreted to mean at least the recited number (*e.g.*, the bare recitation of "two recitations," without other modifiers, means at least two recitations, or two or more recitations). Furthermore, in those instances where a convention analogous to "at least one of A, B, and C, etc." is used, in general such a construction is intended in the sense one having skill in the art would understand the convention (*e.g.*, " a system having at least one of A, B, and C" would include but not be limited to systems that have A alone, B alone, C alone, A and B together, A and C together, B and C together, and/or A, B, and C together, etc.). In those instances where a convention analogous to "at least one of A, B, or C, etc." is used, in general such a construction is intended in the sense one having skill in the art would understand the convention (*e.g.*, " a system having at least one of A, B, or C" would include but not be limited to systems that have A alone, B alone, C alone, A and B together, A and C together, B and C together, and/or A, B, and C together, etc.). It will be further understood by those within the art that virtually any disjunctive word and/or phrase presenting two or more alternative terms, whether in the description, claims, or drawings, should be understood to contemplate the possibilities of including one of the terms, either of the terms, or both terms. For example, the phrase "A or B" will be understood to include the possibilities of "A" or "B" or "A and B."

[0064] In addition, where features or aspects of the disclosure are described in terms of Markush groups, those skilled in the art will recognize that the disclosure is also thereby described in terms of any individual member or subgroup of members of the Markush group.

[0065] As will be understood by one skilled in the art, for any and all purposes, such as in terms of providing a written description, all ranges disclosed herein also encompass any

and all possible subranges and combinations of subranges thereof. Any listed range can be easily recognized as sufficiently describing and enabling the same range being broken down into at least equal halves, thirds, quarters, fifths, tenths, etc. As a non-limiting example, each range discussed herein can be readily broken down into a lower third, middle third and upper third, etc. As will also be understood by one skilled in the art all language such as "up to," "at least," and the like include the number recited and refer to ranges which can be subsequently broken down into subranges as discussed above. Finally, as will be understood by one skilled in the art, a range includes each individual member. Thus, for example, a group having 1-3 cells refers to groups having 1, 2, or 3 cells. Similarly, a group having 1-5 cells refers to groups having 1, 2, 3, 4, or 5 cells, and so forth.

[0066] Various of the above-disclosed and other features and functions, or alternatives thereof, may be combined into many other different systems or applications. Various presently unforeseen or unanticipated alternatives, modifications, variations or improvements therein may be subsequently made by those skilled in the art, each of which is also intended to be encompassed by the disclosed embodiments.

CLAIMS

What Is Claimed Is:

1. A dispensing unit comprising:

a dispensing barrel having a dispensing orifice; and

one concentric ring disposed around a circumference of the dispensing barrel, wherein the concentric ring is configured to permit a user to properly visually align the dispensing barrel above an eye of the user.

2. The dispensing unit of claim 1, wherein the concentric ring is translucent.

3. The dispensing unit of claim 1, wherein the concentric ring is transparent.

4. The dispensing unit of claim 1, wherein the concentric ring is opaque.

5. The dispensing unit of claim 1, wherein the concentric ring has a color that differs from a color of the dispensing barrel.

6. The dispensing unit of claim 5, wherein the concentric ring is configured to permit a user to properly visually align the dispensing barrel when the concentric ring is completely visible to a user during a dispensing operation through the dispensing orifice.

7. The dispensing unit of claim 1, wherein the concentric ring is affixed to the dispensing barrel.

8. The dispensing unit of claim 1, wherein the concentric ring is adhered to the dispensing barrel.

9. The dispensing unit of claim 1, wherein the concentric ring is molded as part of the dispensing barrel.

10. The dispensing unit of claim 1, wherein the dispensing barrel further comprises a reservoir disposed at an end of the dispensing barrel opposite to the dispensing orifice.

11. The dispensing unit of claim 10, wherein the concentric ring is affixed to, adhered to, or molded as part of, the reservoir.

12. The dispensing unit of claim 10, wherein the concentric ring has a color that differs from a color of the reservoir.

13. The dispensing unit of claim 10, wherein the reservoir comprises a second larger concentric ring disposed around the circumference of the dispensing barrel and located between the reservoir and the concentric ring.

14. The dispensing unit of claim 13, wherein the second larger concentric ring is affixed to, adhered to, or molded as part of, the reservoir.

15. The dispensing unit of claim 13, wherein the concentric ring has a color that differs from a color of the second larger concentric ring.

16. The dispensing unit of claim 13, wherein the concentric ring and the second larger concentric ring are configured to permit a user to properly visually align the dispensing barrel when the concentric ring, and an outer ring formed by a portion of the second larger concentric ring not overlapping with the concentric ring, are completely visible to a user during a dispensing operation through the dispensing orifice.

17. The dispensing unit of claim 10, wherein the reservoir comprises a flange having a radius that is larger than a radius of the concentric ring.

18. The dispensing unit of claim 17, wherein the flange has a color that differs from a color of the concentric ring.

19. The dispensing unit of claim 17, wherein the concentric ring and the flange are configured to permit a user to properly visually align the dispensing barrel when the concentric ring, and an outer ring formed by a portion of the flange not overlapping with the concentric ring, are completely visible to a user during a dispensing operation through the dispensing orifice.

20. A dispensing unit comprising:

a dispensing barrel having a dispensing orifice; and

a plurality of concentric rings disposed around a circumference of the dispensing barrel,

wherein the plurality of concentric rings comprise a first concentric ring and a second concentric ring located proximal to the reservoir as compared to the first concentric ring,

wherein the plurality of concentric rings are configured to permit a user to properly visually align the dispensing barrel above an eye of the user.

21. The dispensing unit of claim 20, wherein the first concentric ring has a smaller diameter than, substantially a same diameter as, or a larger diameter than the second concentric ring.

22. The dispensing unit of claim 20, wherein the plurality of concentric rings have substantially equal diameters.

23. The dispensing unit of claim 20, wherein the first concentric ring is transparent.

24. The dispensing unit of claim 20, wherein the first concentric ring is translucent.

25. The dispensing unit of claim 20, wherein the second concentric ring is transparent.

26. The dispensing unit of claim 20, wherein the second concentric ring is translucent.

27. The dispensing unit of claim 20, wherein the second concentric ring is opaque.

28. The dispensing unit of claim 20, wherein the first concentric ring has a first color and the second concentric ring has a second color.

29. The dispensing unit of claim 28, wherein the plurality of concentric rings are configured to permit a user to properly visually align the dispensing barrel by aligning the

first and second concentric rings such that a user perceives a complete ring having a third color, wherein the third color comprises a combination of the first color and the second color.

30. The dispensing unit of claim 20, wherein each of the first and second concentric rings are clear and polarized, wherein the polarization of the first concentric ring differs from the polarization of the second concentric ring.

31. The dispensing unit of claim 30, wherein the plurality of concentric rings are configured to permit a user to properly visually align the dispensing barrel by aligning the first and second concentric rings such that a user perceives a complete dark ring, wherein the complete dark ring results from the differing polarization of the first and second concentric rings.

32. The dispensing unit of claim 20, wherein at least one of the plurality of concentric rings is affixed to the dispensing barrel.

33. The dispensing unit of claim 20, wherein at least one of the plurality of concentric rings is adhered to the dispensing barrel.

34. The dispensing unit of claim 20, wherein at least one of the plurality of concentric rings is molded as part of the dispensing barrel.

35. The dispensing unit of claim 20, wherein the dispensing barrel further comprises a reservoir disposed at an end of the dispensing barrel opposite to the dispensing orifice.

36. The dispensing unit of claim 35, wherein the reservoir comprises a flange having a diameter that is larger than a diameter of each of the plurality of concentric rings.

37. The dispensing unit of claim 36, wherein the flange has a color that differs from a color of the concentric ring.

38. The dispensing unit of claim 36, wherein the first and second concentric rings and the flange are configured to permit a user to properly visually align the dispensing barrel when the first and second concentric rings, and an outer ring formed by a portion of the flange not overlapping with either of the first concentric ring or the second concentric ring, are completely visible to a user during a dispensing operation through the dispensing orifice.

39. A method for applying eye drops to an eye of a user, the method comprising:

placing a dispensing unit above the eye of the user in a dispensing configuration, wherein the dispensing unit comprises a dispensing barrel and one or more concentric rings disposed around a circumference of the dispensing barrel, wherein the dispensing configuration comprises having the dispensing barrel disposed towards the eye of the user;

aligning the dispensing unit so that the one or more concentric rings provide a visual indication of alignment above the eye of the user; and

dispensing one or more eye drops from the dispensing unit to the eye of the user.

40. The method of claim 39, wherein the one or more concentric rings comprise one ring, and wherein the visual indication comprises having the concentric ring completely visible to a user.

41. The method of claim 39, wherein the one or more concentric rings comprise a first ring having a first color and a second ring having a second color that differs from the first color, and wherein aligning the dispensing unit comprises aligning the first and second rings such that a user perceives a complete ring having a third color, wherein the third color comprises a combination of the first color and the second color.

42. The method of claim 39, wherein the one or more concentric rings comprise a first ring having a first polarization and a second ring having a second polarization that differs from the first polarization, and wherein aligning the dispensing unit comprises aligning the first and second rings such that a user perceives a complete dark ring, wherein the complete dark ring results from the differing polarization of the first and second rings.

43. The method of claim 39, wherein the eye drops comprise water, saline solution, eye lubricants, or an ophthalmic medication configured for topical administration to the eye.

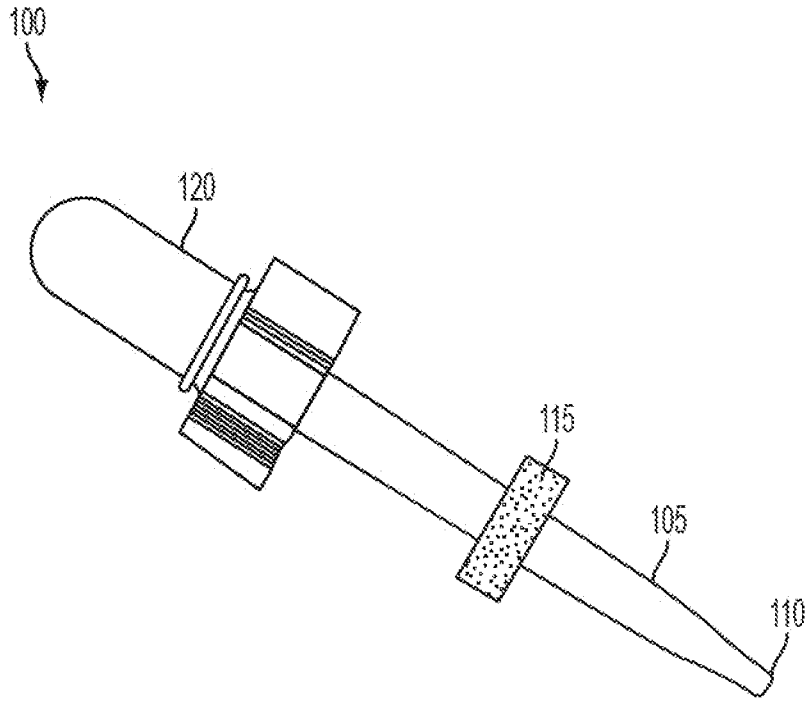


FIG. 1

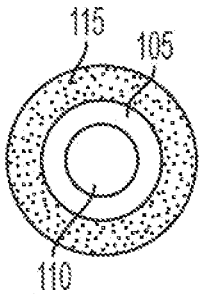


FIG. 2A

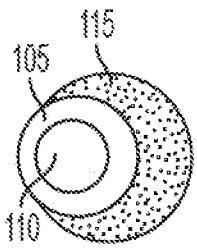


FIG. 2B

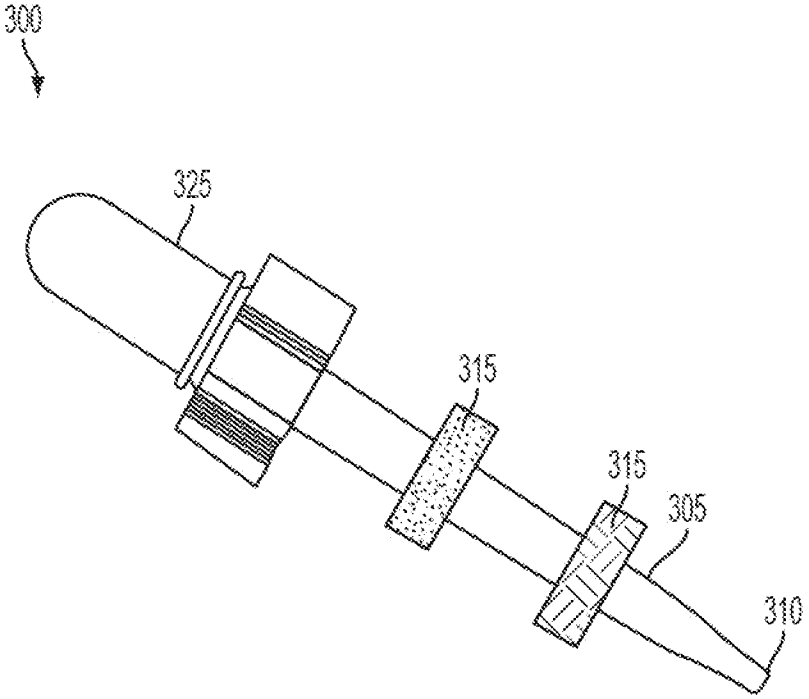


FIG. 3

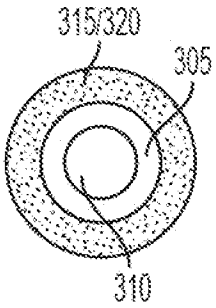


FIG. 4A

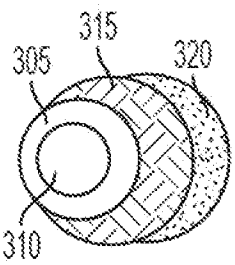


FIG. 4B

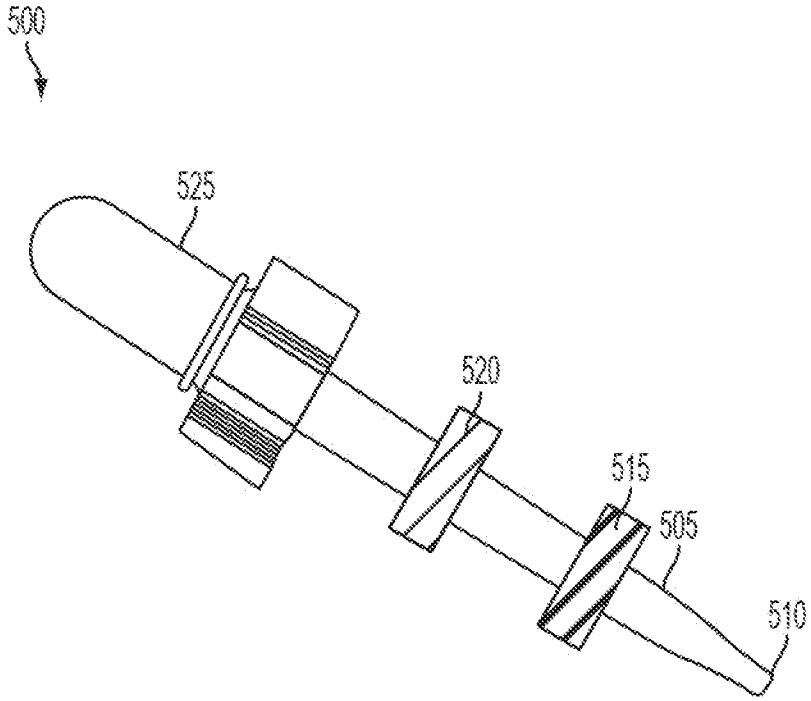


FIG. 5

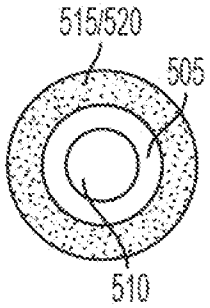


FIG. 6A

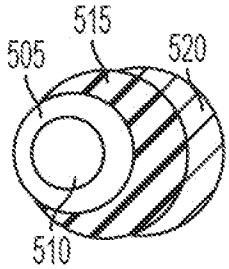


FIG. 6B

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2013/030107

A. CLASSIFICATION OF SUBJECT MATTER
IPC(8) - A61H 33/04 (2013.01)
USPC - 604/302
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC(8) - A61F 9/00; A61H 33/04; A61M 35/00; B67D 5/06 (2013.01)
USPC - 222/181; 604/295, 300, 302

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
CPC - A61F 9/00, 9/0008, 9/0026 (2013.01)

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
PatBase, Google Patent, Google Scholar

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X – Y	US 6,371,945 B1 (SHERMAN) 16 April 2002 (16.04.2002) entire document	1-12, 17-19 --- 13-16, 20-38, 43
X – Y	GB 2,142,829 A (SHAW) 30 January 1985 (30.01.1985) entire document	39, 40 --- 13-16, 20-38, 43
Y	US 2010/0283957 A1 (MATERA et al) 11 November 2010 (11.11.2010) entire document	30, 31
A	US 4,733,802 A (SHELDON) 29 March 1988 (29.03.1988) entire document	1-43
A	US 5,810,794 A (PEPLINSKI) 22 September 1998 (22.09.1998) entire document	1-43

☐ Further documents are listed in the continuation of Box C. ☐

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier application or patent but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
24 April 2013	17 MAY 2013
Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US, Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-3201	Authorized officer: Blaine R. Copenheaver PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774