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(54) Medication dispenser

(57) Disclosed is a dispenser having a first chamber containing a first fluid and a second chamber containing a second material. Each chamber has screw threads that are selectively joinable so that the first and second chambers are twistable relative to one another. The first chamber includes an open top end that is, before use, covered with a breakable membrane. A breaker ring is located within the second chamber and is configured to break the breakable membrane when the dispenser is transitioned between an extended position and a compact position. In the compact position with the breakable membrane broken, the first fluid and second material form a mixture that can be dispensed via an opening created by breaking off the tip of the second chamber.

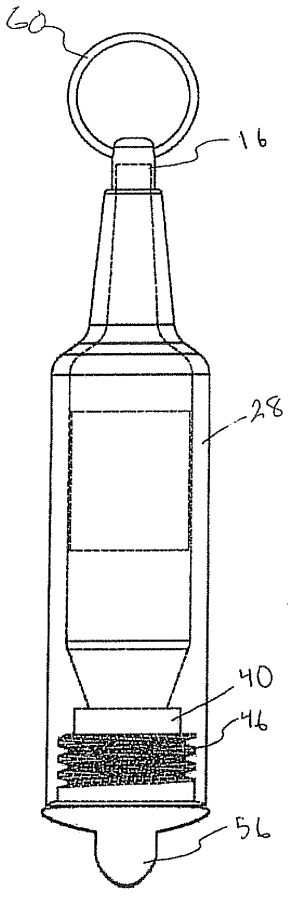

Figure 7

EP 2 851 056 A1

Description

TECHNICAL FIELD

[0001] The presently disclosed and claimed inventive concepts generally relate to an apparatus for administering medication, and more particularly to premeasured dosing of medication.

BACKGROUND

[0002] One of the greatest benefits of modern medicine has been the ability of antibiotics and other medications to cure and treat diseases that have plagued mankind from the beginning of time. While many individuals have access to medications whose usage can be lifesaving, the availability and dispersal of these medications to individuals that truly need them throughout the world has not yet been properly established. One of the reasons for which the dispersal of medication has not been effective in all locations is that, in many locations, individuals do not know how much medication to impart to reach the desired dosing requirements for efficacy wllile also preventing damage to the individual. Another problem that occurs is that, in some instances, the ability to take the medication cannot be effectively performed because of a lack of dispensatory materials at the designated location.

[0003] Additionally, medication to be dispensed in small amounts is often sold in large containers and sent in shipments that may require refrigeration. Thus, the cost of a relatively small amount of medication is increased by the cost of transporting the medication to the desired location and storing the medication. In other instances, the individual needing to use medication is required to purchase a greater amount of medication than is actually needed. In these circumstances the cost of the more-than-needed medication can be prohibitive for the individual.

[0004] Further, the administration of medication often requires more time, knowledge, or precision than an individual is able to apply to the administration of medication. When this occurs, an individual could measure and utilize the medication inappropriately. As a result, individuals may become ill from taking too much of the medication or find that the medication is ineffective against the disease to be treated when improperly-small dosages of the medications are administered. This in turn can lead to a variety of otherwise-avoidable health issues including sickness, discomfort, pain, irritability, and even death to individuals who fail to take the proper medication at the proper times or in the proper amounts.

[0005] As a particular example, in treating bacterial inventions and other bio-hazards, including the defenses against organisms used as bio-weaponry, the improper use or dosing of antibiotics can lead to mutations of the bacteria involved, leading to the creation of medication-resistant bacteria that will not respond to the traditionally-outlined antibacterial regimens.

SUMMARY OF THE DISCLOSURE

[0006] The present dispenser is a dispensing system for dispensing pre-measured doses of selected materials, particularly medications, in a safe and effective manner and in any of a variety of circumstances. The dispenser can be utilized by individuals with little to no medical training and without the need to measure medications to be dispensed.

[0007] The dispenser includes a first chamber containing a first fluid, such as a reconstituting liquid, and a second chamber containing a second material, such as a medication powder. The first chamber has first screw threads lining an external area. The first chamber further has an open top end that is covered by a breakable membrane. For additional protection during transport the breakable membrane may be covered by a breakaway tab. The breakaway tab is removed by a user prior to use. The second chamber has second screw threads lining an internal area. The second chamber further has a break-off tip, which, when removed defines an opening. Contained within the second chamber is a breaker ring having a lower edge configured to break the breakable membrane. The second chamber further has a plug that creates a seal with the breaker ring. This plug prevents contamination getting into the container and prevents material within the container from getting around the lower edge of the breaker ring and occupying the space between the breaker ring and the second screw threads.

[0008] The first and second screw threads are configured to interact with one another such that the first and second chambers can be joined via the screw threads. The first chamber and second chamber are twistable, relative to one another, to move the chambers closer to or further away from one another. The first chamber and second chamber are to be twisted into an extended position in which the lower edge of the breaker ring is situated so as to be above the breakable membrane. Once the breakaway tab covering the breakable membrane is removed, and the plug is removed, the first chamber and second chamber can then be twisted relative to each other to bring the lower edge of the breaker ring into forced contact with the breakable membrane, eventually resulting in breakage of the breakable membrane. Additional twisting of the first chamber and second chamber relative to one another transitions the dispenser to a compact position. In the compact position the first fluid within the first chamber and the second material within the second chamber are able to join into a mixture. When the break-off tip is removed, the mixture can be forced out of the dispenser to be administered to a patient.

[0009] Alternatively, as the first and second screw threads interact to allow twisting of the first and second chambers both closer to and further away from one another, the two chambers of the dispenser can be unconnected from one another and the material within the sec-

ond chamber, which could be medication in a powder form, dispensed by removing the plug and emptying the second chamber via the open bottom end of the chamber, without having to open the break-off tip. Similarly, the material within the first chamber can be separately dispensed, when the two chambers of the dispenser are unconnected, by breaking the breakable membrane and emptying the contents of the first chamber via the open top end of the first chamber.

[0010] In any regard, this dispenser allows a pre-measured dosage of medication to be administered without having to use separate medication delivery devices and without the necessity of separately or carefully measuring the material to be dispensed. Having the material to be dispensed contained within one device lessens the risk of spillage and waste of the material. Further, the dispenser is used with only easy manipulation of a simple and safe device as no external sharp objects need be utilized. Thus, the dispenser can be utilized in a broad variety of circumstances by individuals with little or no training, either in medicine or in use of the dispenser.

[0011] The purpose of the foregoing Smnmary and the Abstract is to enable the public, and especially the scientists, engineers, and practitioners in the art who are not familiar with patent or legal terms or phraseology, to determine quickly from a cursory inspection, the nature and essence of the technical disclosure of the application. The Abstract is neither intended to define the inventive concept(s) of the application, which is measured by the claims, nor is it intended to be limiting as to the scope of the inventive concept(s) in any way.

[0012] Still other features and advantages of the presently disclosed and claimed inventive concept(s) will become readily apparent to those skilled in this art from the following detailed description describing preferred embodiments of the inventive concept(s), simply by way of illustration of the best mode contemplated by carrying out the inventive concept(s). As will be realized, the inventive concept(s) is capable of modification in various obvious respects all without departing from the inventive concept(s). Accordingly, the drawings and description of the preferred embodiments are to be regarded as illustrative in nature, and not as restrictive in nature.

BRIEF DESCRIPTION OF THE DRAWINGS

[0013] Figure 1 is an elevation view of the front of a medication dispenser according to a an embodiment of a dispensing system including broken lines to illustrate the internal components of the embodiment.

[0014] Figure 2 is an elevation view of the right side of a medication dispenser according to an embodiment of a dispensing system including broken lines to illustrate the internal components of the embodiment.

[0015] Figure 3 is an elevation view of the front of a first chamber of a medication dispenser according to an embodiment of the invention.

[0016] Figure 4 is an elevation view of the right side of a first chamber of a medication dispenser according to an embodiment of a dispensing system.

[0017] Figure 5 is an elevation view of a front of a medication dispenser according to an embodiment of a dispensing system.

[0018] Figure 6 is an elevation view of a right side of a medication dispenser according to an embodiment of a dispensing system.

[0019] Figure 7 is a cross-sectional, elevation view of the break-off tip, and plug of a medication dispenser according to an embodiment of a dispensing system.

[0020] Figure 8 is an isometric view of a plug according to an embodiment of a dispensing system.

[0021] Figure 9 is an isometric view of a break-off tip after removal from a second chamber according to an embodiment of a dispensing system.

DEFINITIONS

[0022] In the following description and in the figures, like elements are identified with like reference numerals.

[0023] The use of "e.g.," "etc," and "or" indicates non-exclusive alternatives without limitation unless otherwise noted.

[0024] The use of "including" means "including, but not limited to," unless otherwise noted.

DETAILED DESCRIPTION OF THE EXEMPLARY EMBODIMENTS

[0025] While the dispensing system is susceptible of various modifications and alternative constructions, certain illustrated embodiments thereof have been shown in the drawings and will be described below in detail. It should be understood, however, that there is no intention to limit the invention to the specific form disclosed, but, on the contrary, the invention is to cover all modifications, alternative constructions, and equivalents falling within the spirit and scope of the medication dispenser as defined in the claims.

[0026] As depicted in the drawings, embodiments of the dispensing system provide a system for storing, transporting, and eventually dispensing a pre-measured amount of a mixture of material, such as a medication mixture, where such mixture is originally stored in two separated containers. As such, medication in a solid, powder form can be kept separate from a reconstituting fluid, but in containers quickly and easily combined to provide for mixture of the substances before dispensing of the same without having to use separate dispensing devices and without having to have medical or technological training.

[0027] In the following description and in the figures, like elements are identified with like reference numerals. The use of "e.g.," "etc.," and "or" indicates non-exclusive alternatives without limitation unless otherwise noted. The use of "including" means "including, but not limited to," unless otherwise noted.

[0028] As shown in the figures, the dispensing system includes a dispenser 12. According to a an embodiment, the dispenser 12 includes a first chamber 26 that has an open top end 24. First screw threads 36 line an upper area of the first chamber 26's external surface 22. The first chamber 26 is at least partially compressible, preferably laterally compressible. At least before use, the first chamber 26 contains a first material, such as a fluid. According to the preferred embodiments, the first material is a fluid, specifically a reconstituting fluid. In some embodiments, the reconstituting fluid is a liquid such as water. In other embodiments, the reconstituting fluid is a gas such as air. Further, at least before use, the open top end 24 is covered by a breakable membrane 30 (shown in Figure 4). The breakable membrane 30 closes off the open top end 24 so that the reconstituting fluid is contained within the first chamber 26. In one embodiment, the breakable membrane 30 is further covered by a removable tab. A removable tab provides additional protection to breakable membrane 30 during transport and prevents accidental connection of the chambers 26, 28.

[0029] The dispenser 12 of the depicted embodiments further includes a second chamber 28 that has an open bottom end. Second screw threads 46 line a lower area of the second chamber 28's internal surface. Preferably, the second screw threads 46 are recessed within the wall of the second chamber 28. This minimizes the bulk of the second chamber 28 and thus the bulk of the dispenser 12 itself. Contained within the second chamber 28 is a second material, preferably the second material is a medication, preferably in a solid, powder farm. In other embodiments, the second material is a second fluid, such as a medication in liquid form.

[0030] The second chamber 28 further includes a break-off tip 16 (shown in Figure 7) that is broken off by a user to form an opening, preferably at the upper-most portion of the second chamber 28. In one embodiment, the break-off tip 16 uses a ring 60 attached to the break-off tip 16 to allow a user to insert a finger for improved leverage, alternatively, a solid flat disc can be used to allow a user to grasp the disc and twist until the tip breaks away from the dispenser, or other suitable devices can be used. The second chamber 28 can be configured to allow administration of the desired medication through either oral or nasal pathways once the break-off tip 16 is removed.

[0031] Also, according to the depicted embodiments, the dispenser 12 further includes a breaker ring 40 within the second chamber 28, situated above the second screw threads 46. In order to seal open bottom end of the second chamber from contamination, such as dirt, water, or other contaminants, plug 56 is included (as shown in Figure 7). Plug 56 can be configured to screw into second screw threads 46, press-fit into open bottom end 38 and held by friction, or other means of adhering plug 56 within open bottom end 38. Plug 56 is configured to prevent contamination of the second material by external matter and to prevent travel of the second material from inside said second chamber 28, around the lower edge and into the space between said breaker ring 40 and second screw threads 46. In one embodiment, the plug 56 is a long cylindrical member 58 having a length great enough to extend from the open bottom end 30 to breaker ring 40. Cylindrical member 58 as a diameter large enough to fully cover breaker rind 40. In one embodiment, cylindrical member 58 is held in place by friction with second screw threads 46. As one possible alternative, cylindrical member 58 is held to breaker ring 40 through suction. In another embodiment, cylindrical member 58 has third screw threads on its exterior which interact with second screw threads 46 to hold cylindrical member 58 in place.

[0032] The second screw threads 46 of the second chamber 28 are configured to correspond with the first screw threads 36 of the first chamber 26 such that the second chamber 28 and first chamber 26 are configured to be selectively joinable to one another via interaction of the first screw threads 36 and second screw threads 46 (see figure 1). Correspondingly, the first chamber 26 and second chamber 28 are configured to be selectively disconnected from one another via interaction of the first screw threads 36 and the second screw threads 46. For example, in some embodiments, the screw threads 36, 46 are configured such that a clockwise rotation of the first chamber 26 relative to the second chamber 28 will draw the two chambers 26, 28 into closer proximity with one another while a counterclockwise rotation of the first chamber 26 relative to the second chamber 28 will move the two chambers 26, 28 further away from one another, eventually disconnecting the chambers 26, 28 from one another. As shown in the figures, twisting the second chamber 28 relative to the first chamber 26 to join the two together effectively closes the second chamber 28 to prevent the material within, such as a medication, from leaving the dispenser 12.

[0033] Before use, the first chamber 26 and second chamber 28 are joined and arranged in an extended position, shown in Figures land 2, in which the narrow lower edge of the breaker ring 40 is external to the second chamber 28 and is not in contact with the breakable membrane 30. The first chamber 26 and second chamber 28 are further twistable, relative to one another, via interaction of the second screw threads 46 and first screw threads 36, so that the second chamber 28 and first chamber 26 are brought into closer proximity to one another. Enough twisting eventually transitions the dispenser 12 to a compact position, shown in Figure 5. In the compact position, the narrow lower edge of the breaker ring 40 is received within the open top end 24 of the first chamber 26. During twisting of the first chamber 26 and second chamber 28 relative to one another to transition the dispenser 12 from the extended position to the compact position, the narrow lower edge of the breaker ring 40 is brought into forced contact with the breakable membrane 30 covering the open top end 24 of the first cham-

ber 26. Additional twisting results in the narrow lower edge breaking the breakable membrane 30. Once the breakable membrane 30 is broken, the first chamber 26 and second chamber 28 form a joined chamber within the dispenser 12. Accordingly, the medication that was originally contained within the second chamber 28 and the reconstituting fluid 32 that was originally contained with the first chamber 26 can mix and form a medication mixture. Ideally, the medication may be shaken or otherwise agitated to encourage mixing of the medication and reconstituting fluid 32 between the two chambers 26, 28. It is further preferable that the first screw threads 36 of the first chamber 26 and the second screw threads 46 of the second chamber 28 are configured to form a fluid-tight seal so that, once the breakable membrane 30 is broken, none of the reconstituting fluid 32 or medication mixture will unintentionally leave the dispenser 12.

[0034] The breaker ring 40 of the first depicted embodiment, shown in Figure 6, includes a narrow lower edge that is smooth and even along its edge. According to the first depicted embodiment, the narrow lower edge defines a lower plane that is essentially parallel to an upper plane defined by the wide upper edge. Such lower plane and upper plane are also essentially parallel to the middle plane defined by the peripheral protrusion.

[0035] The breaker ring 40 of an alternative embodiment, includes a narrow lower edge that has a protruding member. The protruding member is configured to break the breakable membrane 30 upon forced contact with the breakable membrane 30. Preferably, the protruding member is a sharp point. As such, forced contact of the tip of the sharp point with the breakable membrane 30 will result in first a puncturing of the breakable membrane 30 followed by a general breakage of the breakable membrane 30 as the breaker ring 40 is brought into further forced contact with the breakable membrane 30 as the first chamber 26 and second chamber 28 are twisted relative to one another. In other embodiments, the breaker ring 40 includes a number of protruding members along the narrow lower edge.

[0036] The breaker ring 40 of an alternative embodiment includes a narrow lower edge that is smooth and even along its edge. Further the narrow lower edge defines a lower plane that is not parallel to an upper plane defined by the wide upper edge Rather, the narrow lower edge of the breaker ring 40, according to the third depicted embodiment, slants such that one area of the narrow lower edge will come into contact with the breakable membrane 30 first, before the other areas of the narrow lower edge as the dispenser 12 is transitioned between the extended position and the compact position. As such, the forced interaction of the narrow lower edge and the breakable membrane 30 will, at least at first, be concentrated on the lowest area of the narrow lower edge , encouraging breakage of the breakable membrane 30 in that area of contact.

[0037] To dispense the medication mixture to a patient, once the breakable membrane 30 is broken and the dispenser 12 twisted so that it is in the compact position, the break-off tip 16 can be removed so as to form an opening 34. Thereafter, the first chamber 26 may be compressed so as to force the medication mixture out of the first chamber 26, through the breaker ring 40, and out of the second chamber 28 via the opening 34. In some situations, the first chamber 26 is compressed due to physical squeezing of the first chamber 26. In other situations, the first chamber 26 is compressed due to the application of suction within the dispenser 12.

[0038] The dispenser 12 is further configured such that the material within the first chamber 26 can be dispensed without removing the break-off tip 16. That is, the first chamber 26 and second chamber 28 can be selectively disconnected from one another via twisting in the opposite direction that one would twist to transition the dispenser 12 from the extended position to the compact position. This twisting will eventually separate the two chambers 26, 28 from each other. Thereafter, the material within the second chamber 28, such as the medication, can be emptied via the open bottom end 38. Alternatively or additionally, the breakable membrane 30 can be broken with means other than the breaker ring 40, such as by application of pressure with a finger or fingernail against the breakable membrane 30 or with the use of a separate puncturing device, so as to make accessible the open top end 24. Thereafter, the material within the first chamber 26 can be emptied via the open top end 24. Accordingly, separation of the two chambers 26, 28 from one another provides an option for dispensing of the medication to a patient without mixing the materials contained separately in chamber 26 and chamber 28. Further, the separation of the two chambers 26, 28 allows a user to refill or replace material within one or the other chamber 26, 28 before or without mixing the materials.

[0039] According to one embodiment, the medication within the second chamber 28 is a solid powder. In other embodiments, the medication is in fluid form. In still other embodiments, the material within the second chamber 28 is a non-medicinal material. Further, according to the depicted embodiments, the second chamber 28 is made up of a translucent plastic that is noncompressible. Also according to the depicted embodiments, the first chamber 26 tapers in width along the lower part of the first chamber 26 such that the open top end 24 is broader than the bottom edge 52. In this way, the tapering section forms a handle. As it is preferred that the first chamber 26 be compressible, according to the depicted embodiments, the first chamber 26 is preferably compressible laterally, such that the individual dispensing the medication would squeeze along the tapering area.

[0040] The exemplary embodiments shown in the figures and described above illustrate, but do not limit, the dispensing system. It should be understood that there is no intention to limit the dispensing system to the specific form disclosed; rather, the dispensing system is to cover all modifications, alternative constructions, and equivalents falling within the spirit and scope of the dispenser

as defined in the claims. For example, while the dispensing system is not limited to use with orally-administered medication, it is expected that various embodiments of the dispensing system will be particularly useful in such applications. Hence, the foregoing description should not be construed to limit the scope of the invention, which is defined in the following claims.

[0041] Accordingly, while there is shown and described the present preferred embodiments of the dispensing system, it is to be distinctly understood that this dispensing system is not limited thereto but may be variously embodied to practice within the scope of the following claims. From the foregoing description, it will be apparent that various changes may be made without departing from the spirit and scope of the invention, as defined by the following claims.

Claims

1. A medication dispensing system comprising:

a twistable medication dispenser comprising:

a first chamber, said first chamber having an openable top end, an external surface, and first screw threads lining an upper area of said external surface: said first chamber being at least partially compressible;
a reconstituting liquid contained within said first chamber;
a breakable membrane covering said open top end of said first chamber, said breakable membrane further covered by a breakaway tab;
a second chamber, said second chamber having an internal surface, an openable tip, and second screw threads lining a lower area of said internal surface, said second chamber being selectively joinable to said first chamber via interaction of said first screw threads and said second screw threads;
a pre-selected quantity of powder medication contained within said second chamber; a breaker ring within said second chamber, situated above said second screw threads, said breaker ring being fixedly attached to said internal surface along a peripheral protrusion, said breaker ring tapering from a wide upper edge to a narrow lower edge, said narrow lower edge being configured to be received within said open top end of said first chamber, said breaker ring having a protruding member extending away from its narrow lower edge, said protruding member being configured to break said breakable membrane upon forced contact with said breakable membrane;
A removable plug configured to fit securely within said second screw threads and create a seal with said breaker ring;
upon removal of said removable plug, said first chamber being twistable relative to said second chamber via said first screw threads and said second screw threads to transition said twistable medication dispenser from an extended position in which said protruding member is external to said second chamber and is not in contact with said breakable membrane to a compact position in which said narrow lower edge is received within said open top end of said first chamber;
said protruding member being configured to break open said breakable membrane when said first chamber is twisted to transition said twistable medication dispenser from said extended position to said compact position;
said openable tip comprising a breakaway tip wherein a user can selectively break off said tip to create an opening in said openable tip;
whereby twisting of said first chamber relative to said second chamber to transition said twistable medication dispenser from said extended position to said compact position causes said protruding member to break open said breakable membrane such that said medication within said second chamber and said reconstituting liquid within said first chamber mix to form a medication mixture; and
whereby, following creation of said opening in said openable tip, compression of said first chamber while said twistable medication dispenser is in said compact position forces said medication mixture out of said first chamber, through said breaker ring, and out of said second chamber via said opening.

2. The medical dispensing system of claim 1 wherein said openable top end of said first chamber further comprises a break off tab to prevent accidental breaking of the breakable membrane.

3. The medical dispenser of claim 1 wherein said plug further comprises third screw threads, said third screw threads being selectively joinable of said second screw threads.

4. The medical dispenser of claim 1 wherein said plug further comprises third screw threads, said third

screw threads lining a lower area of said plug, said third screw threads being selectively joinable to said second screw threads.

5. The medical dispenser of claim 1 wherein said plug is held within said second screw threads by friction.

6. The medical dispenser of claim 1 wherein said plug is held within said second screw threads by a suction force from said second chamber.

7. The medication dispenser of claim 1, wherein said medication contained within said second chamber is a powder.

8. The medication dispenser of claim 1, wherein said second chamber comprises a translucent plastic.

9. The medication dispenser of claim 1, wherein said second chamber comprises a noncompressible plastic.

10. The medication dispenser of claim 1, wherein said first chamber tapers in width from said open top end to a bottom edge.

11. The medication dispenser of claim 1, wherein said breaker ring further has an upper edge, said upper edge defining an upper plane, said lower edge defining a lower plane, said lower plane being aligned so as to not be parallel to said upper plane.

12. The medication dispenser of claim 1, wherein said device is used in a nasal administration.

Figure 1

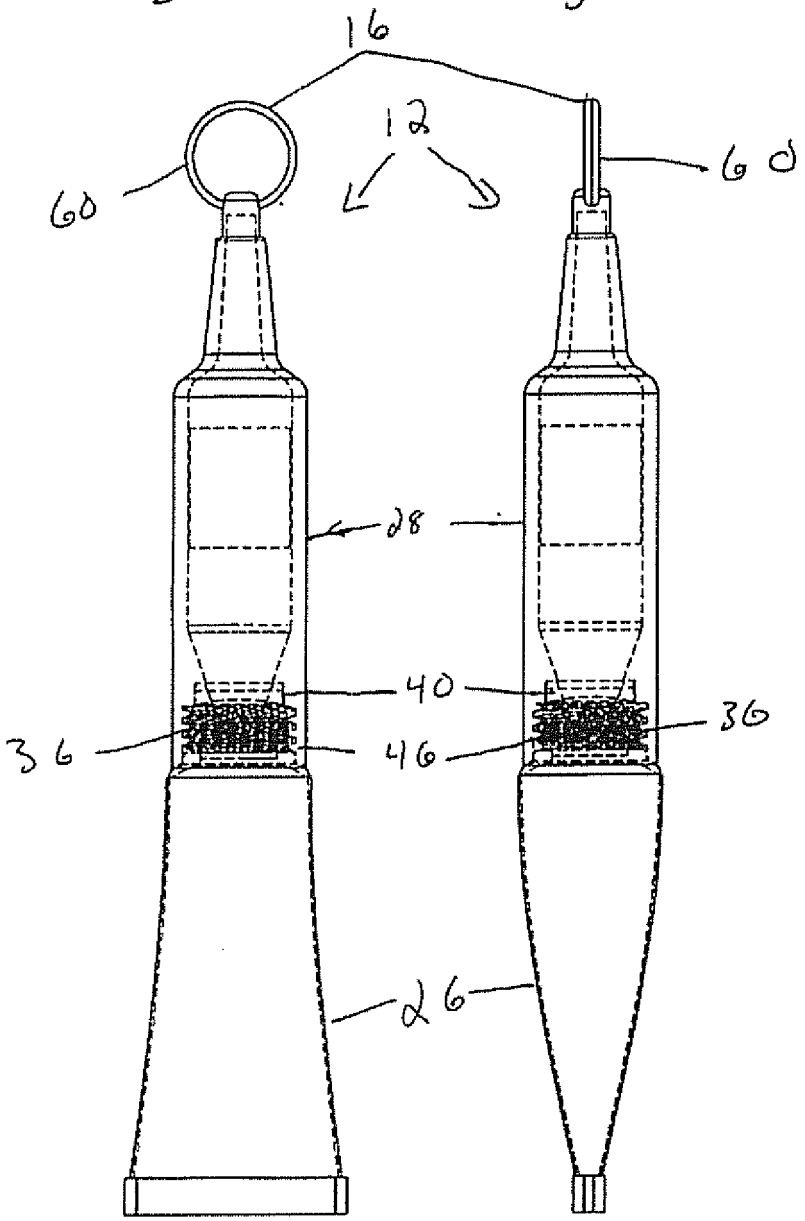

Figure 2

Figure 6

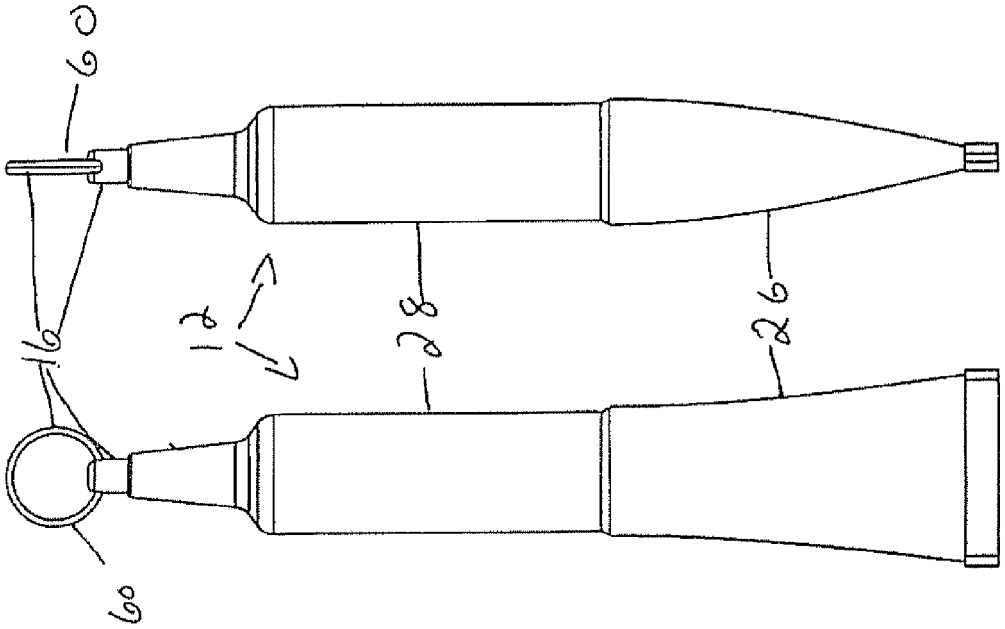

Figure 5

Figure 4

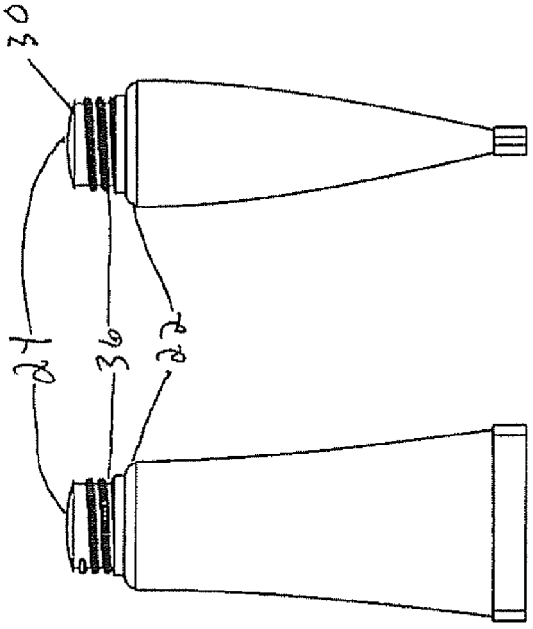

Figure 3

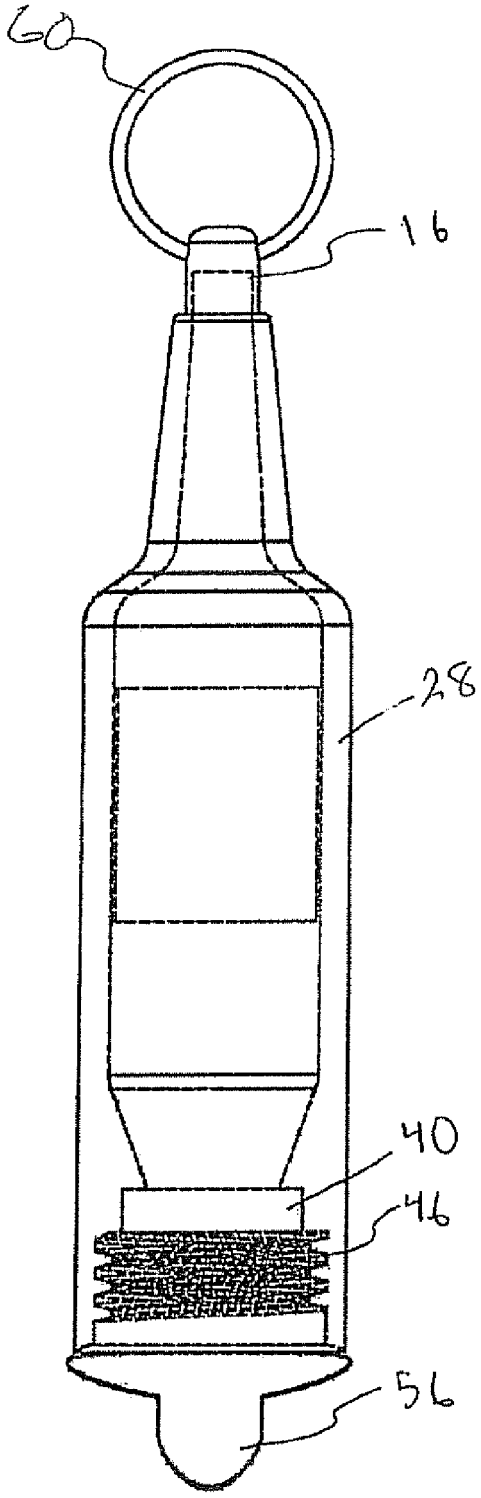

Figure 7

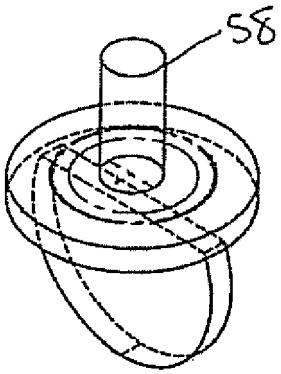

Figure 8

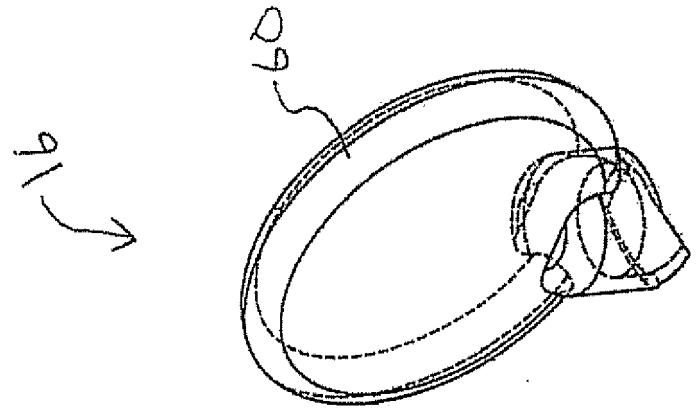

Figure 4

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EUROPEAN SEARCH REPORT

Application Number
EP 13 18 5270

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	US 2011/178459 A1 (YEAKLEY ROURKE M [US] ET AL) 21 July 2011 (2011-07-21) * the whole document *	1-12	INV. A61J1/06 A61J1/10 A61J1/20
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A	US 2006/289316 A1 (HENRY JOHN R [US]) 28 December 2006 (2006-12-28) * the whole document *	1	
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A	US 3 404 811 A (JOSE CERNEI) 8 October 1968 (1968-10-08) * the whole document *	1	
A	US 4 632 244 A (LANDAU BORIS [US]) 30 December 1986 (1986-12-30) * the whole document *	1	TECHNICAL FIELDS SEARCHED (IPC) A61J B65D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	13 February 2014	Edlauer, Martin

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 13 18 5270

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13-02-2014

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