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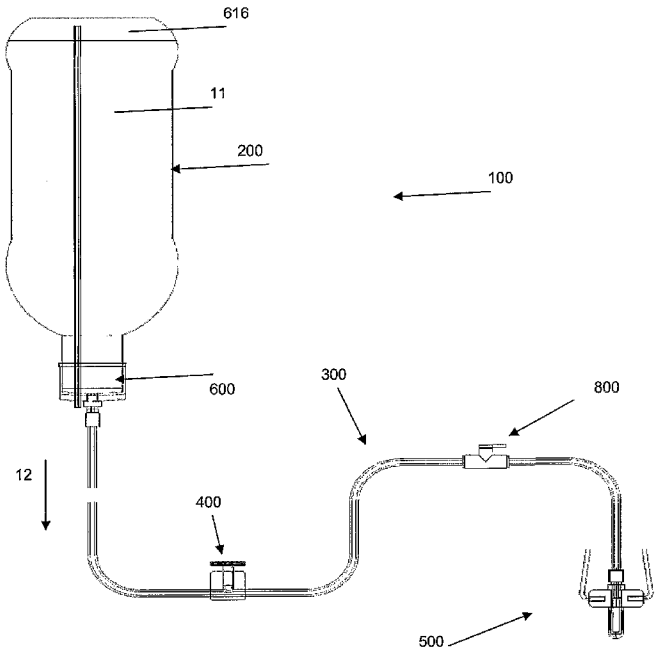


(57) Abstract: The present invention relates to an oral fluid dispenser, having a vessel containing fluid; a dispenser configured to deliver fluid orally; a tube; a metering assembly; wherein the first distal end of the tube is attached to the vessel and the second distal end of the tube is attached to the dispenser and the metering assembly is positioned between the first and second distal ends of the tube; and, characterised in that fluid flows from the vessel via the tube to the dispenser at a flow rate determined by the metering assembly.

WO 2008/020767 A1

ORAL DRIP SYSTEM (MEDICAL DEVICE)

TECHNICAL FIELD

The present invention relates to a dispenser. More specifically, the invention relates to a dispenser configured to orally provide an individual with fluid, at a rate that can be manipulated by the individual for use in medical conditions such as Xerostomia or Dry Mouth Syndrome.

BACKGROUND ART

Xerostomia or Dry Mouth Syndrome refers to the loss of normal salivary gland function, leaving a person with a dry mouth. This syndrome is a common problem for a large number of people, not as a disease per se, but a symptom of different factors including: various drugs and medications, radiation or chemotherapy treatment, diseases such as Sjögren's syndrome or Eaton-Lambert syndrome, nerve damage and various other conditions, such as transplants, endocrine disorders, psychological disorders, and nutritional deficiencies.

If Xerostomia is not recognised and treated, then sleeping problems can result, as the person can be continually be waking up to relieve the dry mouth. Dental hygiene is also another problem with this syndrome, as saliva is a natural mechanism to prevent tooth decay and any disruption to saliva production may allow tooth decay to proceed more quickly.

A range of treatments exist to alleviate Xerostomia, including: chewing gum, mints or candy, electro-stimulation of the salivary glands, or special chemical formulations as a saliva substitute or saliva stimulants.

Electro-stimulation involves the use of a devise that provides a low-voltage electrical stimulus to the salivary glands. This is described in a number of articles such as; Talal N, Quinn JH, Daniels TE; *The clinical effects of electrostimulation on salivary function of Sjögren's syndrome patients. A placebo controlled study*; Rheumatol Int. 1992:12(2):43-5. However this method of treatment can be painful and may not provide relief for some patients.

Other treatments include the use of special formulations, including: over the counter (OTC) products and prescription only products. Formulations come in solutions, sprays, gels or lozenges, and include artificial saliva or saliva substitutes,

which replace saliva and provide lubrication. Some products available are outlined in Table 1 below:

These formulations can include artificial saliva or a saliva substitute, which replace saliva and to provide lubrication not stimulate saliva gland function. Some products that are available include the products outlined in Table 1 below:

Product Name	Manufacturer	Product Form
Entertainer's Secret®	KLI Corp	Spray
Glandosane®	Kenwood/Bradley	Spray
Moi-Stir®	Kingswood Labs	Spray
Moi-Stir® Oral Swabsticks	Kingswood Labs	Swabs
Optimoist®	Colgate-Palmolive	Spray
Saliva Substitute®	Roxane Labs	Liquid
Salivart®	Gebauer	Preservative-free aerosol
Salix®	Scandinavian Natural Health & Beauty	Tablets
V. A. Oralube®	Oral Dis. Res. Lab	Sodium-free; liquid
Xero-Lube® Artificial Saliva	Scherer	Sodium-free; spray
MouthKote®	Parnell	Spray

TABLE 1: Artificial Saliva Products that are available over the counter.

Saliva stimulants are also available products available over the counter. Natrol Dry Mouth Relief, developed by Natrol and Amarillo is one example of this type of product.

Dentifrices are another type of product available. These include products, such as those outlined in Table 2 below:

Biotene® Dry Mouth Toothpaste
Biotene® Gentle Mouthwash
Biotene® Dry Mouth Gum
Oralbalance® Long-lasting Moisturizing Gel
Biotene® Dry Mouth Kit

TABLE 2: Available Dentifrice Products for combating Xerostomia.

Prescription products such as Pilocarpine, Cevimeline Anethole Trithione, or Yohimbine are also available for a person suffering with Dry Mouth Syndrome.

A problem with the above products is that they can be expensive to purchase, particularly if a prescription is required for some of these formulations. In addition, some products may irritate the digestive system or not provide sufficient relief from the syndrome. Further, for these formulations to effectively work, they have to be constantly re-applied over time, which is not always practical, especially when sleeping.

Ordinary water is also another method for treating Xerostomia. Water is a more cost effective method to provide relieve to a dry mouth but again, has the problem of needing to be constantly reapplied.

As noted above, the above formulations, including water, are inconvenient to apply or reapply when the person is trying to sleep. If the person requires an application at night, they have to wake up to take their medication. This disrupts a person's

sleeping pattern, which besides being inconvenient can also lead to further health problems.

To assist in fluid delivery, there are also various devices available. One such device is described in United States Patent No. 4,966,580. This device orally administers fluid upon demand, when the user sucks or presses on a nipple, which is connected to a fluid reservoir via a tube. While this device is able to dispense fluid, this device still requires the user to initiate the fluid flow. This action may not be easily remembered or even possible for example when the user is sleeping. Therefore, the device may not provide a sufficient amount of fluid to provide relieve to a dry mouth in all potential situations.

Another fluid dispensing device is described in United States Patent No. 6,413,238. This patent describes a device that has a feedback system that sensors environmental or external pressure changes and self adjusts the rate of fluid flow from a reservoir at one distal end of the device. To achieve the desired flow control, complex systems and sensors are used, thereby creating an expensive and complex system. While the need to sense changes in environment and regulate fluid flow is necessary in some applications, such as for intravenous and intra-arterial drips, this type of system is over-completed and unnecessary for the simple application of providing fluid to a person orally. Further, the use of a sensor system increases the cost to manufacture the system.

Therefore, it would be useful to have a device that could continually dispense fluid into the mouth of a person with a dry mouth, without the need to reapply or re-administer the formulation regularly, especially during sleep and do not require complicated systems or rely on alert cognitive functions to dispense fluid. Having a device that is also light weight, cost effective, small, and easy to store would also be an advantage.

It is an object of the present invention to address the foregoing problems or at least to provide the public with a useful choice.

All references, including any patents or patent applications cited in this specification are hereby incorporated by reference. No admission is made that any reference constitutes prior art. The discussion of the references states what their

authors assert, and the applicants reserve the right to challenge the accuracy and pertinence of the cited documents. It will be clearly understood that, although a number of prior art publications are referred to herein, this reference does not constitute an admission that any of these documents form part of the common general knowledge in the art, in New Zealand or in any other country.

It is acknowledged that the term 'comprise' may, under varying jurisdictions, be attributed with either an exclusive or an inclusive meaning. For the purpose of this specification, and unless otherwise noted, the term 'comprise' shall have an inclusive meaning - i.e., that it will be taken to mean an inclusion of not only the listed components it directly references, but also other non-specified components or elements. This rationale will also be used when the term 'comprised' or 'comprising' is used in relation to one or more steps in a method or process.

Further aspects and advantages of the present invention will become apparent from the ensuing description which is given by way of example only.

DISCLOSURE OF THE INVENTION

The inventor of the present invention has developed a device that provides fluid to a person, at a rate that can be adjusted by the person to suit their requirements. By combining the elements of the device, the fluid is dispensed automatically, without requiring further manipulation by the person.

According to one aspect of the present invention there is provided an oral fluid dispenser including:

- a vessel containing fluid;
- a dispenser;
- a tube;
- a metering assembly;

wherein the first distal end of the tube is attached to the vessel and the second distal end of the tube is attached to the dispenser;

and the metering assembly is positioned between the first and second distal ends of the tube;

characterised in that fluid flows from the vessel via the tube to the dispenser at a flow rate determined by the metering assembly.

It will be appreciated that the vessel may be any container that can hold an amount of fluid. Preferably, the vessel may be a water bottle. In other embodiments, the vessel may be a larger reservoir.

Preferably, the vessel may be sealed. Preferably, the vessel may be sealed by a suitable cap. Preferably, the cap may be releasably attached to the vessel. It should be appreciated that attachment and detachment of the cap from the reservoir may allow the vessel to be refilled, minimising costs. Alternatively, as the vessel may be made of inexpensive materials, for example, plastic, the container may be thrown out after use and still remain cost effective.

Preferably, the cap and the tube may be attached together via a nozzle. Preferably, the nozzle may be a stainless steal hose nipple. Preferably, the cap includes an aperture, through which the nozzle is inserted and held in place. It should be appreciated that the aperture may be a size suitable to allow the fluid to flow at a desired rate from the vessel and into the tube.

Preferably, there may be a pressure equalising (PE) tube protruding into the vessel. Preferably, the PE tube may be attached to the cap with one distal end of the PE tube open to the environment and the opposing distal end located around the base of the vessel.

Preferably, when the vessel is in use, the vessel is orientated in a direction so the fluid can flow through the aperture into the cap, through the nozzle and into the tube. It should also be appreciated that air is able pass into the vessel via the PE tube, preventing the vessel from developing a vacuum.

It should be appreciated that the fluid may be a gel, liquid or a gas. Preferably, the fluid is a liquid. More preferably, the fluid may be water. Preferably, the water may be distilled and/or filtered water. In other embodiments, the fluid may be a composition or known formulation that is specifically used as a saliva substitute, such as those described above in Table 1. In a further embodiment, the fluid is a saliva substitute and water mixture.

Preferably, the dispenser may have a fastener attached to the second distal end of the tubing. Preferably, the fastener may have at least one aperture from which the

fluid is dispersed. Preferably, the fastener may be a stainless steel hose nipple. In preferred embodiments, the dispenser may have a soft outer shield, such as a silicon shield surrounding the hose nipple. In selected embodiments, the outer shield may be a shroud that surrounds the fastener. In one embodiment, the outer shield may surround only the surface area of the dispenser, while in other preferred embodiments, the outer shield may surround a larger surface area, such as a teat on a pacifier. In a yet further embodiment, the dispenser may be formed from one piece wherein the nipple and other fittings are formed as one part unable to be separated non-destructively.

Preferably, the dispenser may be configured to prevent air from flowing back into the tubing. Preferably, this configuration may be achieved by having at least two apertures on either side of the silicon shield from where the fluid may be dispensed.

In preferred embodiments, the dispenser may be attached to a frame to hold the dispenser in place. In one embodiment, the dispenser may be attached to a cradle and head band. Preferably, the cradle may be attached to moulding surrounding the hose nipple via at least one length of wiring which attaches to the head band.

In an alternative embodiment, the dispenser may be attached or be integral with an oxygen mask or oxygen nose tubes. It should be appreciated that the present invention configured for use in this way allows a user to wear both an oxygen providing device and a dispenser of the present invention.

Preferably, the tubing may be substantially flexible. Preferably, the tubing may be of a suitable pharmaceutical grade.

Preferably, the tubing may be cleanable. In an alternative embodiment, the tubing is replaced after use of one or more times.

Preferably, the metering assembly regulates the fluid flow. Preferably, the metering assembly may be a mechanism which depresses onto the length of tubing. Preferably, the depression may cause a partial seal to constrict the diameter of a portion of the tubing.

Preferably, the metering assembly may be a ball valve. Preferably, the ball valve may have a ball that presses onto the tubing. Preferably, the pressure of the ball may be controlled by a suitable knob or handle.

Optionally, multiple lengths of tubing may be used where the ends of each tube may be linked together via a suitable attachment mechanism. In a preferred embodiment, the attachment mechanism may be at least one valve. Preferably, the valve may have an open configuration and closed configuration. When the valve is in an open configuration, fluid may flow through from the first length of tubing to the second length of tubing. Preferably, when the valve is in a closed configuration, the valve may seal the end of the first length of tubing, to prevent the fluid from flowing out the end of first length of tubing, into the second length of tubing.

Preferably, the metering assembly may be adjustable while the dispenser is in use. It will be appreciated that the ability to adjust the fluid flow while the dispenser is in use, will be an advantage particularly when the user has just started using the device and suitable trials may be required to find the fluid flow suited for that individual. Further, this may allow the user to adjust the fluid flow to suit their requirements for a particular night, when the user may find that they require extra fluid on one particular night. For example, when external environmental conditions vary, such as during the warmer, summer nights, the user may require the fluid flow during that night to be increased. By allowing the metering assembly to be adjustable while the dispenser is in use, this can be easily achieved by a few simple actions without the requirement on the device having to be reset or reprogrammed.

Preferably, the metering assembly may be manually controlled by the user. In other embodiment's the metering assembly may be automatically controlled. It should be appreciated that the metering assembly is configured to allow the user to set a flow rate suiting their personal requirements. By way of example, in one embodiment found satisfactory by the inventor, the flow rate is equivalent to one drop per 5 to 25 seconds. This flow rate was found to be sufficient to not flood the users mouth and yet still sufficient to address a dry mouth. It should appreciated that the flow is adjustable and the rate of flow may need to be greater for some users and lower for other users as may be easily managed via the fluid dispenser of the present invention.

According to a further aspect of the present invention there is provided an oral fluid dispenser substantially as described above wherein the metering assembly

includes a ball that compresses the tube and restricts or unrestricts flow of fluid through the tube.

According to a further aspect of the present invention there is provided an oral fluid dispenser substantially as described above wherein the metering assembly provides fluid at a rate of one drip every 15 to 20 seconds.

According to a further aspect of the present invention there is provided the use of an oral fluid dispenser as substantially described above, in the treatment of a dry mouth.

According to a further aspect of the present invention, there is a method of treating a dry mouth, using an oral fluid dispenser as substantially described above.

As noted above, a dry mouth may be a condition in itself or symptomatic of diseases, such as Sjögren's syndrome or Eaton-Lambert syndrome, the result of particular medication that a person may be on, radiation or chemotherapy treatment for cancer, nerve damage, or various other conditions, such as transplants, endocrine disorders, psychological disorders or nutritional deficiencies.

It should be appreciated from the above description that preferred embodiments of the present invention may have a number of advantages over the prior art which may include:

- an easy to use device that provides fluid at a rate that suits the individual user;
- a device that is comfortable to wear;
- a device sufficiently compact and light weight.

BRIEF DESCRIPTION OF DRAWINGS

Further aspects of the present invention will become apparent from the ensuing description which is given by way of example only and with reference to the accompanying drawings in which:

Figure 1 shows an elevation section view of one preferred embodiment of the present invention;

Figure 2 shows elevation section views of one preferred arrangement of the tube attached to the vessel of the present invention; where:

Figure 2a shows the components assembled;

Figure 2b shows the components in an exploded view;

Figure 3 shows elevation section views of one preferred arrangement of the metering assembly of the present invention; where:

Figure 3a shows the components assembled;

Figure 3b shows the components in an exploded view;

Figure 4 shows elevation section views of one preferred arrangement of the dispensing portion of the present invention; where:

Figure 4a shows the components assembled;

Figure 4b shows the components in an exploded view;

Figure 5 shows a head band embodiment to hold the dispensing portion;

Figure 6 shows an alternative head band embodiment to hold the dispensing portion; and,

Figure 7 shows chin mounted embodiment to hold the dispensing portion in place.

BEST MODES FOR CARRYING OUT THE INVENTION

Referring to Figure 1, there is shown a dispenser as indicated in the general direction of arrow 100. The dispenser 100 includes a vessel 200 containing fluid 11, a tube 300, a metering assembly 400 and a dispensing portion 500.

As shown in Figure 1, the tube 300 attaches to the vessel 200 via a cap 600. Figure 1 also shows an optional extra valve 800 to fully stop or start flow of fluid through the tube 300. In practice, an extra valve 800 performing a start and stop function is useful so that the metering assembly 400 can be set to the users desired rate and not readjusted frequently.

Figure 2, shows a detail view of the cap 600, vessel 200 and tube 300. Figure 2a shows an elevation section of the assembled cap 600 attached to the vessel 200, while Figure 2b shows an exploded section view of the parts and their relative position to each other, as indicated by the dotted lines 614 and 615. The cap 600 has a Pressure Equalising (PE) tube 612, which protrudes from a first aperture 611 into the vessel 200, allowing air to flow into the vessel 200 and prevent the vessel from forming a vacuum. Also connected to the cap 600 is a nozzle 613 and tube 300. The nozzle 613 forms part of a second aperture 610, through which fluid 11 passes from the vessel 200 to the tube 300.

Figure 3 shows elevation section views of the metering assembly 400. As shown, Figure 3a shows the components of the metering assembly 400 assembled, while Figure 3b shows the components of the metering assembly 400 in an exploded section view. The metering assembly 400 is in the form of a ball valve mechanism 400. The valve mechanism 400 has a body portion 410 that encases a portion of the tube 300. In this embodiment, the body portion 410 of the metering assembly 400 has an aperture into which a handle 411 and shaft portion 412 are inserted, which in turn forces a ball bearing 413 to compress the tube 300, thus restricting the tube 300 opening. Fluid (not shown) flowing through the tube 300 is regulated by how compressed the tube 300 is by the handle 411, shaft portion 412, and ball bearing 413.

Figure 4 shows one preferred embodiment of the dispensing portion 500. Figure 4a shows the dispensing portion 500 assembled, while Figure 4b shows the components of the dispensing portion 500 in an exploded section view. The dispensing portion 500 has a fastener in the form of a hose nipple 510a and 510b attached to the tubing 300. As shown in Figure 4b, the hose nipple consists of two sections, 510a and 510b. Attached to the hose nipple 510a and 510b is a silicon shield 511. Surrounding the hose nipple 510a and 510b is a cradle 512. The cradle 512 has two apertures 513a and 513b that receives two wire prongs 514a and 514b, which form part of a head cradle to hold the dispensing portion in place.

Example embodiments of how the cradle 512 is held in place are shown on Figures 5 to 7.

Referring first to Figure 5, an embodiment is shown where the dispenser portion 500 is held in the user's mouth via a cradle 512 and head mounting 700. The head mounting 700 includes a head band 701 worn around the users head. The

dispensing portion 500 is attached to the head band 701 via a rigid support 704 such as the cradle shown in Figure 4 numbered 512. The tube 300 is attached to the dispensing portion and directed via the rigid support 704. The support 704 releasably attaches the dispensing portion 500 to the head band 701 via button projections 705 although it should be appreciated that other methods of attachment may be used such as Velcro™. The head band 701 also includes a fastening mechanism 702 such as an elastic section to help mould the head band 701 to the users head. Other fastening mechanisms may also be used such as Velcro™ or intermeshing sections such as those used in baseball caps. In a further embodiment, the head band 701 may be one piece of material with elastic properties which may be moulded to the size of the users head.

Figure 6 shows an alternative embodiment where the head band 701 also includes a perpendicular section 706 which provides further reinforcement holding the head band 701 in place both around the head and over the top of the user's head.

Figure 7 shows a further embodiment where the dispensing portion 500 is held in place using a chin mounting. A chin receiving portion 607 is attached to an elastic material 608 which is worn around the user's neck and head. A rigid or semi-rigid supporting frame 609 is attached to the chin receiving portion 607 and extends to receive the dispensing portion 500 in a position approximate the user's mouth.

To use the device 100, the user wears the head mounting 700 and inverts the vessel 200 so the cap 600 is at the bottom of the vessel 200, and PE tube 612 projects into the air gap 616 at the top of the vessel. The dispensing portion 500 is placed in the user's mouth (not shown). The user then sets the flow rate by opening and/or adjusting the metering assembly 400. Fluid 11 will then flow from the vessel 200 in the general direction of arrow 12, via the aperture 610 and the nozzle 613 in the cap 600 and into the tube 300. Fluid 11 will then flow through the tube 300, in the direction of arrow 12, until the fluid 11 reaches the aperture 515 on the silicon shield 511 of the dispensing portion 500. To adjust the flow rate of the fluid 11, the user turns the handle 411 of the metering assembly 400 in the direction that provides them with more or less fluid, as desired. By turning the handle 411, the shaft portion 412 depresses the ball bearing 413 into the tube 300

When the device 100 is not required any further, such as when the user is awake and able to drink water from a glass, the device 100 can be easily disassembled and packed away.

From the above description it would be apparent that there is a dispenser that can be tailored to provide fluid at a rate that suits the user, while still being easy to use, and comfortable to wear.

Aspects of the present invention have been described by way of example only and it should be appreciated that modifications and additions may be made thereto without departing from the scope thereof as defined in the appended claims.

WHAT WE CLAIM IS:

1. An oral fluid dispenser including:

   a vessel containing fluid;

   a dispenser configured to deliver fluid orally;

   a tube;

   a metering assembly;

   wherein the first distal end of the tube is attached to the vessel and the second distal end of the tube is attached to the dispenser and the metering assembly is positioned between the first and second distal ends of the tube; and,

   characterised in that fluid flows from the vessel via the tube to the dispenser at a flow rate determined by the metering assembly.

2. The oral fluid dispenser as claimed in claim 1 wherein the vessel is a water bottle.

3. The oral fluid dispenser as claimed in claim 1 or claim 2 wherein the vessel is sealed by a suitable cap.

4. The oral fluid dispenser as claimed in claim 3 wherein the cap is releasably attached to the vessel.

5. The oral fluid dispenser as claimed in claim 3 or claim 4 wherein the tube is attached to the cap via a nozzle.

6. The oral fluid dispenser as claimed in claim 5 wherein the nozzle is a stainless steel hose nipple.

7. The oral fluid dispenser as claimed in any one of claims 3 to 6 wherein the cap includes an aperture, through which the nozzle and/or tube is inserted and held in place.

8. The oral fluid dispenser as claimed in any one of the above claims wherein the vessel has a pressure equalising (PE) tube protruding into the vessel.

9. The oral fluid dispenser as claimed in claim 8 wherein the PE tube is attached to the cap and the opposing distal end located around the base of the vessel.

10. The oral fluid dispenser as claimed in claim 5 or claim 6 wherein, when the vessel is in use, the vessel is orientated in a direction so the fluid can flow through the aperture into the cap, through the nozzle and into the tube.

11. The oral fluid dispenser as claimed in any one of the above claims wherein the fluid is a gel, liquid or a gas.

12. The oral fluid dispenser as claimed in any one of the above claims wherein the fluid is water.

13. The oral fluid dispenser as claimed in claim 12 wherein the water is distilled and/or filtered water.

14. The oral fluid dispenser as claimed in any one of claims 1 to 11 wherein the fluid is a saliva substitute formulation.

15. The oral fluid dispenser as claimed in any one of claims 1 to 11 wherein the fluid is a saliva substitute and water mixture.

16. The oral fluid dispenser as claimed in any one of the above claims wherein the dispenser has a fastener attached to the second distal end of the tubing.

17. The oral fluid dispenser as claimed in claim 16 wherein the fastener has at least one aperture from which the fluid is dispersed.

18. The oral fluid dispenser as claimed in claim 16 or claim 17 wherein the fastener is a stainless steel hose nipple.

19. The oral fluid dispenser as claimed in any one of the above claims wherein the dispenser has a soft outer shield.

20. The oral fluid dispenser as claimed in claim 19 wherein the soft outer shield is a silicon shield.

21. The oral fluid dispenser as claimed in claim 19 or claim 20 wherein the soft outer shield is a shroud which envelops the dispenser.

22. The oral fluid dispenser as claimed in any one of claims 19 to 21 wherein the soft outer shield is a teat.

23. The oral fluid dispenser as claimed in any one of claims 19 to 21 wherein the soft outer shield has at least two apertures on either side of the silicon shield from where the fluid may be dispensed.

24. The oral fluid dispenser as claimed in any one of the above claims wherein the dispenser is configured to prevent air from flowing back into the tubing.

25. The oral fluid dispenser as claimed in any one of the above claims wherein the dispenser is attached to a frame used to hold the dispenser in or adjacent to the users mouth.

26. The oral fluid dispenser as claimed in claim 25 wherein the frame includes a cradle and head band.

27. The oral fluid dispenser as claimed in any one of claims 1 to 24 wherein the dispenser is attached or integral with an oxygen mask or oxygen nose tubes.

28. The oral fluid dispenser as claimed in any one of the above claims wherein the metering assembly regulates flow of fluid to the mouth of the user.

29. The oral fluid dispenser as claimed in any one of the above claims wherein the metering assembly is a ball valve assembly where a ball depresses onto the tube to constrict or un-constrict tubing.

30. The oral fluid dispenser as claimed in any one of the above claims wherein multiple lengths of tubing are used with tubes linked together.

31. The oral fluid dispenser as claimed in claim 30 wherein the tubes are linked using at least one valve.

32. The oral fluid dispenser as claimed in any one of the above claims, wherein the metering assembly is adjustable while in use.

33. The oral fluid dispenser as claimed in any one of the above claims wherein the metering assembly is manually controlled by the user to set a desired flow rate.

34. The oral fluid dispenser as claimed in any one of claims 1 to 31 wherein the metering assembly is automatically controlled.

35. The oral fluid dispenser as claimed in any one of the above claims wherein the rate of fluid flow from the dispenser is one drip per 5 to 25 seconds.

36. The oral fluid dispenser as claimed in any one of the above claims wherein the oral fluid dispenser is used in the treatment of a dry mouth.

37. An oral fluid dispenser including:

a vessel containing fluid;

a dispenser configured to deliver fluid orally;

a tube;

a metering assembly; and,

wherein the first distal end of the tube is attached to the vessel and the second distal end of the tube is attached to the dispenser and the metering assembly is positioned between the first and second distal ends of the tube; and,

characterised in that fluid flows from the vessel via the tube to the dispenser at a flow rate determined by the metering assembly, wherein the metering assembly includes a ball valve used to control the rate of fluid flow through the tube.

38. An oral fluid dispenser including:

a vessel containing fluid;

a dispenser configured to deliver fluid orally;

a tube;

a metering assembly;

wherein the first distal end of the tube is attached to the vessel and the second distal end of the tube is attached to the dispenser and the metering assembly is positioned between the first and second distal ends of the tube; and,

characterised in that fluid flows from the vessel via the tube to the dispenser at a flow rate of one drip per 5 to 25 seconds.

39. An oral fluid dispenser including:

a vessel containing fluid;

a dispenser configured to deliver fluid orally;

a tube;

a metering assembly;

wherein the first distal end of the tube is attached to the vessel and the second distal end of the tube is attached to the dispenser and the metering assembly is positioned between the first and second distal ends of the tube;

characterised in that fluid flows from the vessel via the tube to the dispenser at a flow rate determined by the metering assembly; and,

further characterised that the oral fluid dispenser is used in the treatment of a dry mouth.

40. A method of treating a dry mouth, by using an oral fluid dispenser, the oral fluid dispenser including:

a vessel containing fluid;

a dispenser configured to deliver fluid orally;

a tube;

a metering assembly;

wherein the first distal end of the tube is attached to the vessel and the second distal end of the tube is attached to the dispenser and the metering assembly is positioned between the first and second distal ends of the tube; and,

characterised in that fluid flows from the vessel via the tube to the dispenser at a predetermined flow rate.

41. The oral fluid dispenser as claimed in claim 39 or claim 40 wherein a dry mouth is a symptom associated with diseases, such as Sjögren's syndrome or Eaton-Lambert syndrome or combinations thereof.

42. The oral fluid dispenser as claimed in claim 39 or claim 40 wherein a dry mouth is a result medication that a person may be taking, due to radiation or chemotherapy treatment for cancer, due to nerve damage, due to a transplant, due to an endocrine disorder, due to a psychological disorder, due to a nutritional deficiency, and combinations thereof.

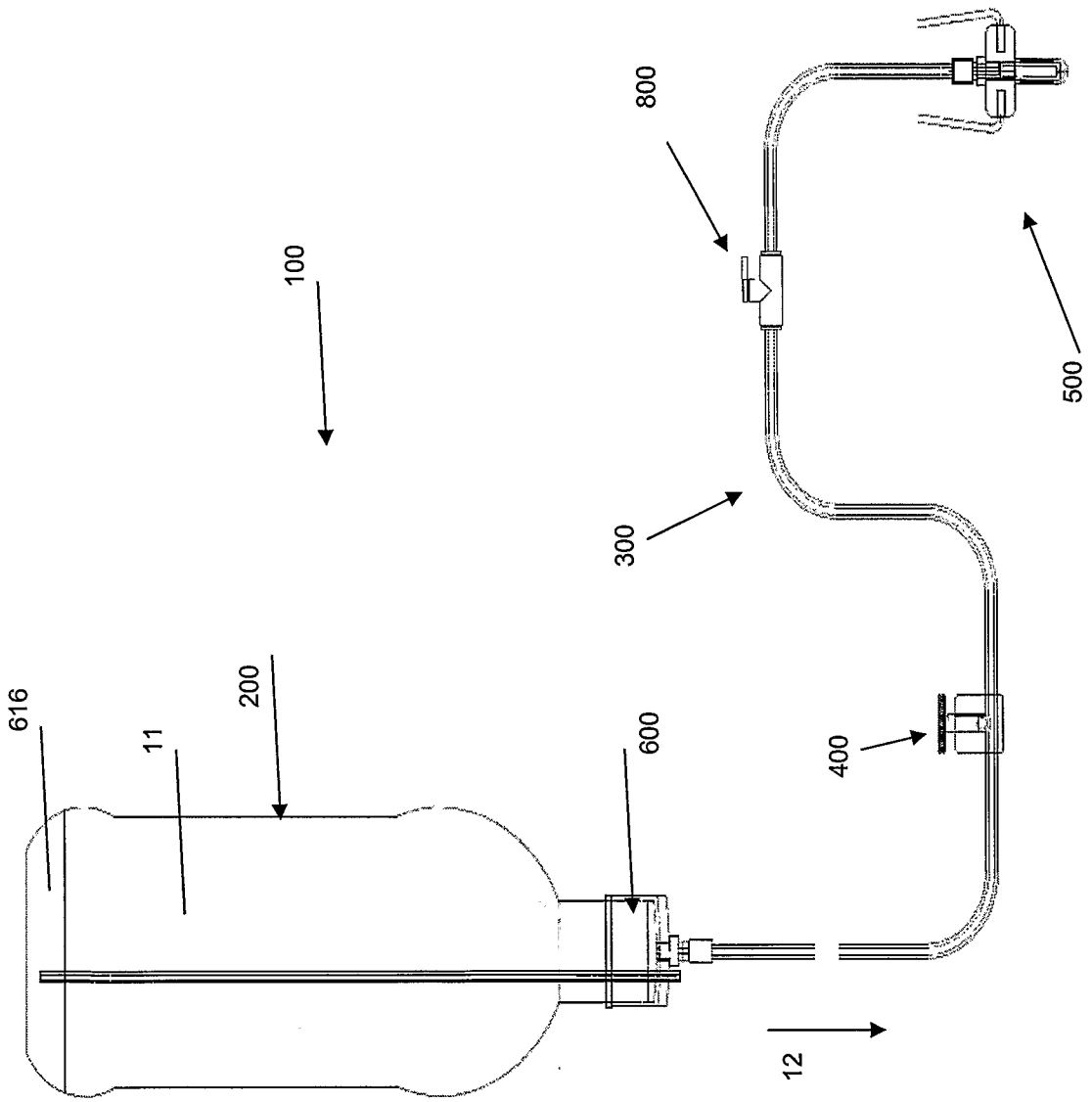


FIGURE 1

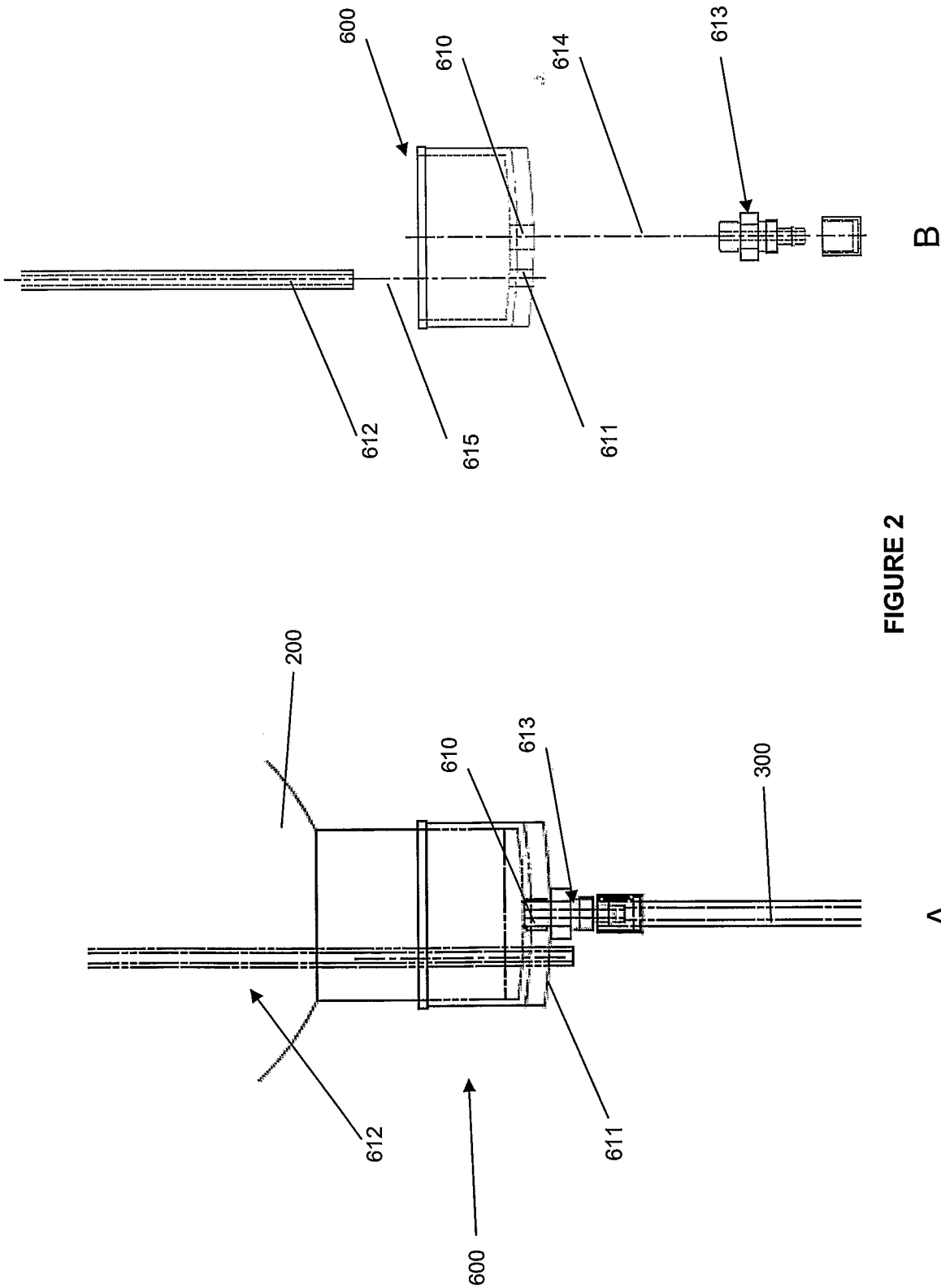
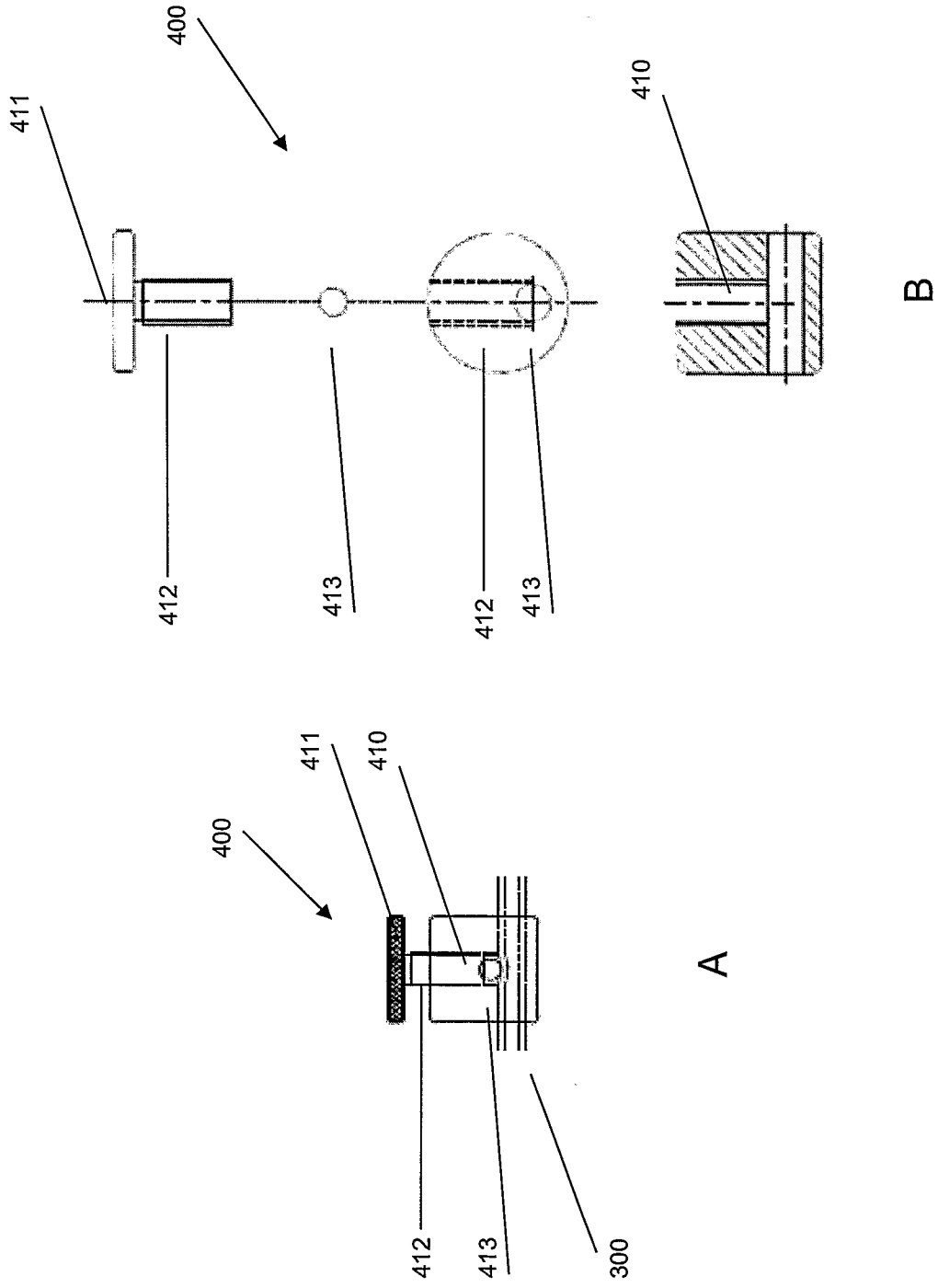


FIGURE 2



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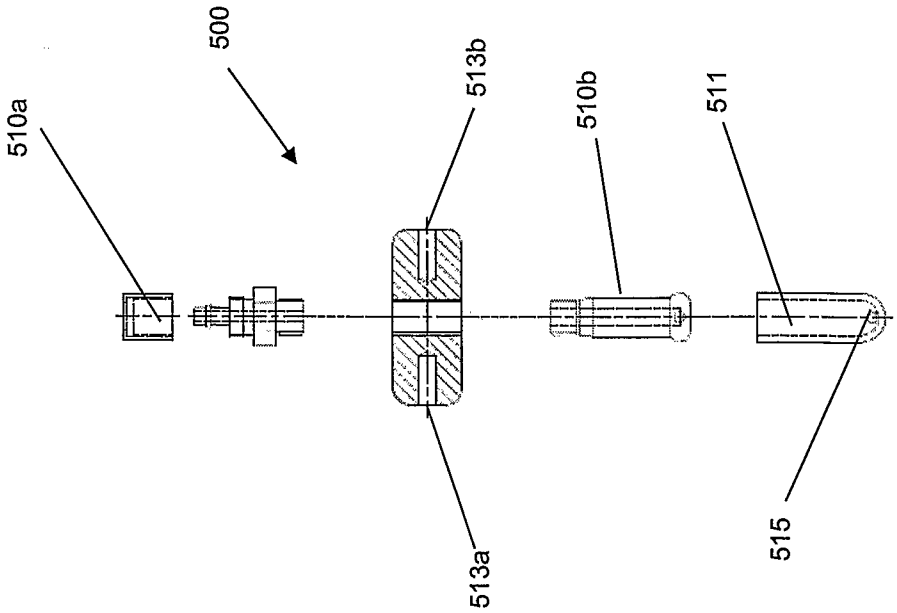
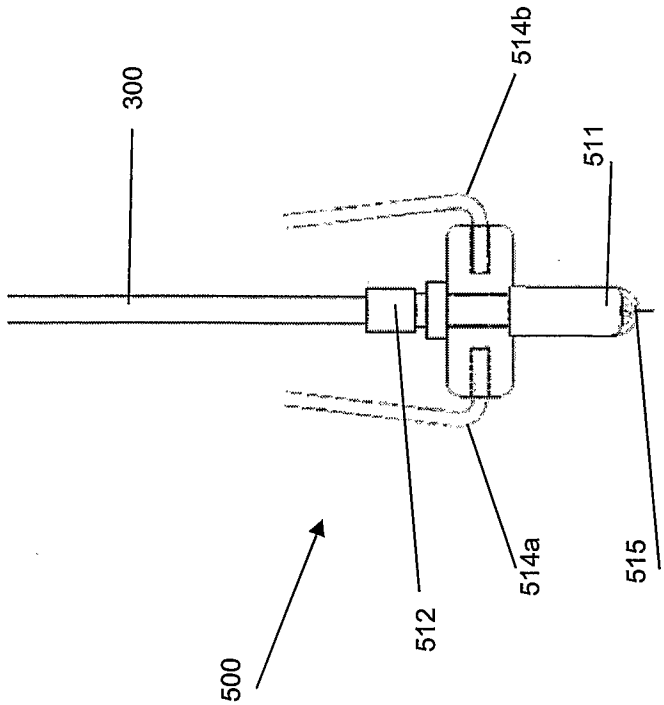


B



A

FIGURE 4

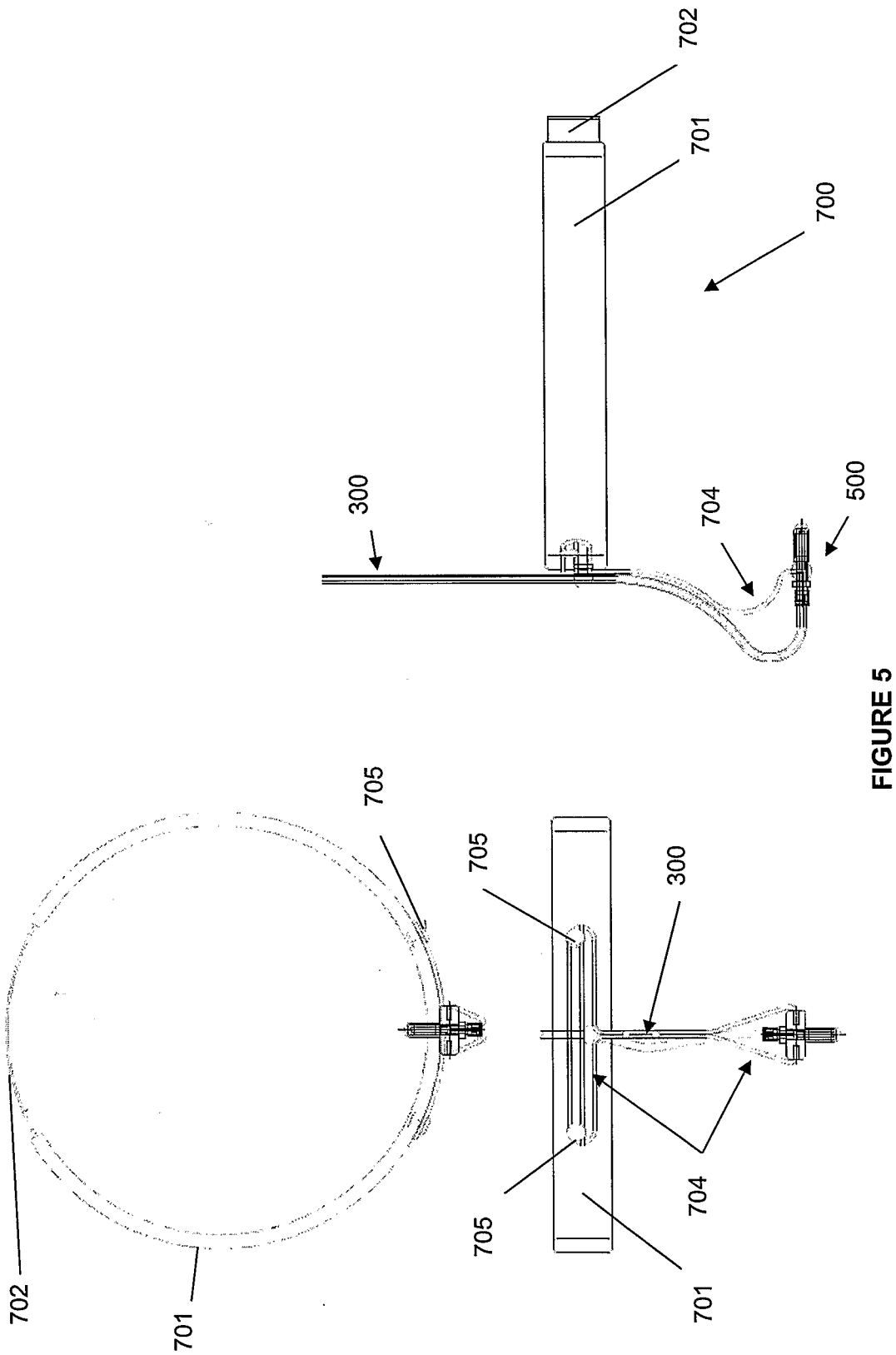


FIGURE 5

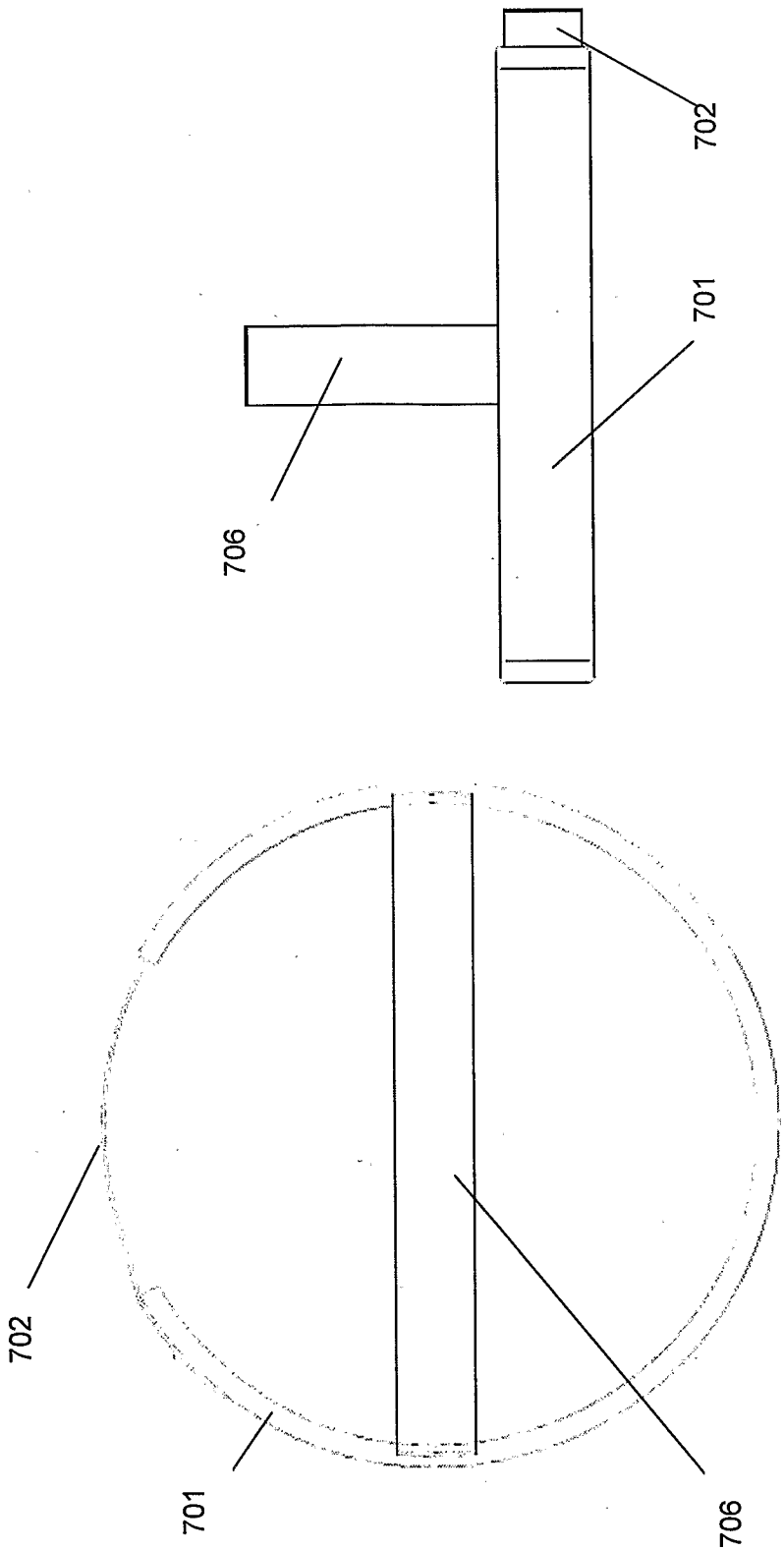


FIGURE 6

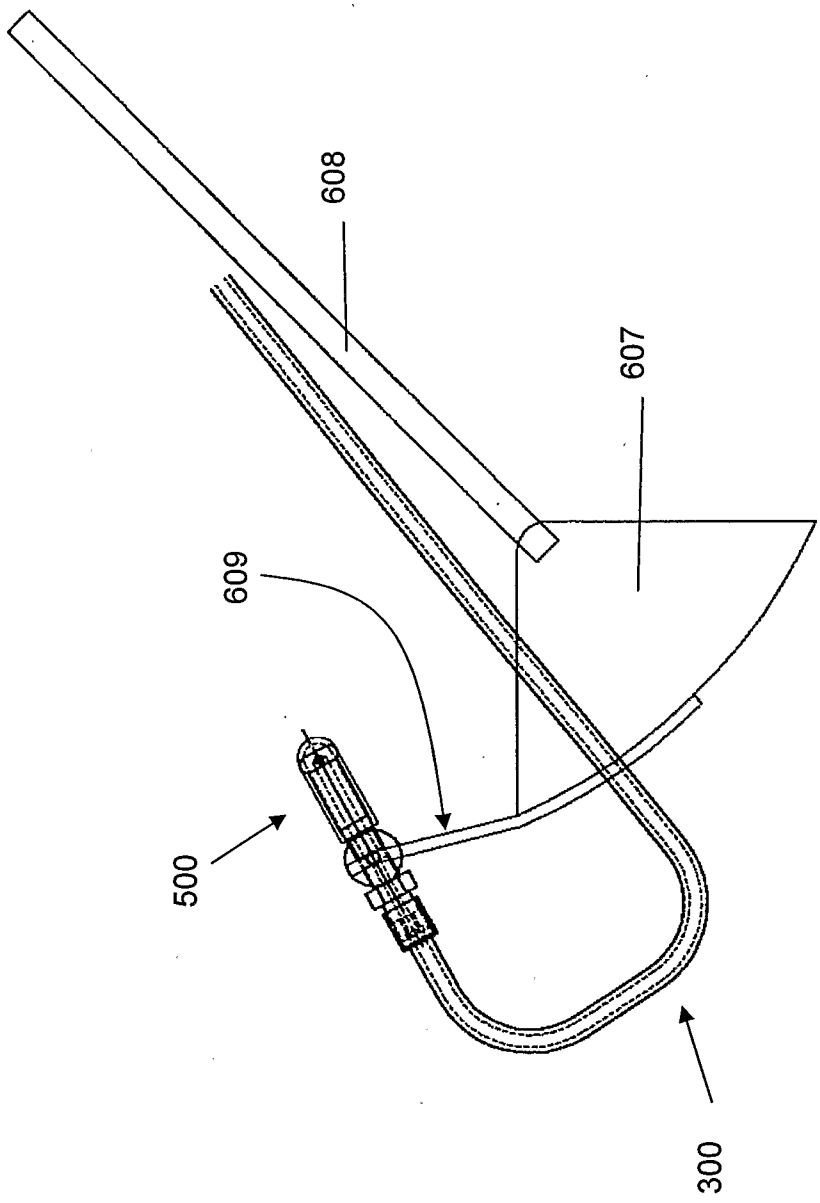


FIGURE 7

INTERNATIONAL SEARCH REPORT

International application No.
PCT/NZ2007/000209

A. CLASSIFICATION OF SUBJECT MATTER

Int. Cl. ***A61J 15/00*** (2006.01) ***A61J 9/00*** (2006.01)
A61C 17/02 (2006.01) ***A61M 39/00*** (2006.01)

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)

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
DWPI: IPC A61J, A61C, A61M & Keywords (Xerostomia, Dry Mouth, Dispenser, Drip, Feed, Oral, Fluid, Liquid, Meter, Dose, Adjust, Control, Flow, Vessel, Reservoir, Tube, Conduit, Moisture, Hydrate) and similar terms

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P, X	US 2007/0204867 A1 (KENNEDY, JR. et al.) 6 September 2007 See whole document.	1-42
X	EP 0349261 A1 (TURNER et al.) 3 January 1990 See whole document. Figure 1 in particular.	1-7, 10-24, 27-31, 35-42
X	US 2003/0116158 A1 (CONWAY) 26 June 2003 See abstract and figures.	1-7, 10-17, 25-30, 35-36, 38-42

[X] Further documents are listed in the continuation of Box C [X] See patent family annex

* Special categories of cited documents:

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"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
28 November 2007	07 DEC 2007

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/NZ2007/000209

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	GB 2202449 A (NATIONAL RESEARCH DEVELOPMENT CORPORATION) 28 September 1988 See figures 1 to 3.	1-7, 10-20, 24, 28, 33-36, 38-42
X	GB 2181958 A (NATIONAL RESEARCH DEVELOPMENT CORPORATION) 7 May 1987 See figure 1 in particular.	1-7, 10-20, 24, 28, 30-31, 33-36, 38-42
A	WO 2005/087176 A1 (PONTIS) 22 September 2005 See whole document.	
A	US 2002/0115961 A1 (WRITT, SR.) 22 August 2002 See figure 1.	
P, A	FR 2889807 A1 (AUTONOMIE MEDICALE LYONAISE SARL) 23 February 2007 See figure 1 and 2.	

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.
PCT/NZ2007/000209

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document Cited in Search Report		Patent Family Member					
US	2007204867						
EP	0349261	GB	2220363	JP	2077257	US	5057077
US	2003116158	US	6536423	US	2002017292		
GB	2202449						
GB	2181958	EP	0240561	US	4813933	US	4966580
		WO	8702579				
WO	2005087176	EP	1729716	FR	2867382		
US	2002115961						
FR	2889807						

Due to data integration issues this family listing may not include 10 digit Australian applications filed since May 2001.

END OF ANNEX