



(51) International Patent Classification:

A61M 5/31 (2006.01) A61M 5/28 (2006.01)
A61M 5/178 (2006.01) A61M 5/32 (2006.01)

(21) International Application Number:

PCT/CA2016/000190

(22) International Filing Date:

7 July 2016 (07.07.2016)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

62/195,823 23 July 2015 (23.07.2015) US

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(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JP, KE, KG, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

[Continued on next page]

(54) Title: SHROUD FOR A DENTAL SYRINGE AND COMBINATION THEREOF

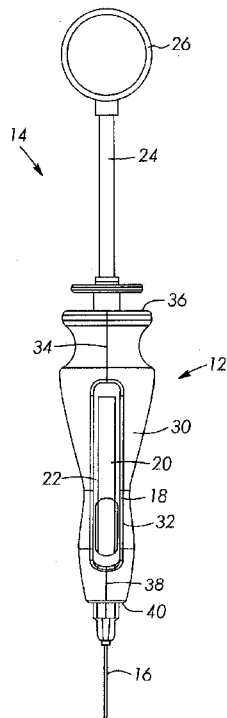


FIG. 1

(57) Abstract: A combination for use in dentistry, the combination comprising a syringe and a single unit, hingeless shroud fitted around said syringe. The syringe comprises a housing with an opening for accepting a carpule; a finger grip; a plunger with a thumb ring; and a needle hub. The hingeless shroud comprises a flexible wall defining a bore therethrough terminating in a distal aperture and a proximal aperture; a front slot aligned with a front opening; an optional back slot aligned with the front opening; a distal aperture curved lip shaped to accept the needle hub, a proximal aperture located collar shaped to accept the finger grip; and at least a proximal slit extending between and continuous with the front slot and the proximal aperture for opening the shroud to insert the syringe therein. The shroud is made of elastic material that can be autoclaved and reused.



Published:

— *with international search report (Art. 21(3))*

SHROUD FOR A DENTAL SYRINGE AND COMBINATION THEREOF

Cross reference to related applications:

This application is related to, and claims the benefit of, U.S. Provisional Patent Application No. 62195823, filed July 23, 2015. The above-identified priority patent application is incorporated herein by reference in its entirety.

Field:

The present technology is a flexible shroud for masking a dental syringe. More specifically, it is a reusable, flexible cover used to create a more patient friendly syringe.

Background:

Many dental patients dislike needles and in fact, some are afraid of them. This makes trips to the dentist unpleasant. As a result, there have been a number of covers and shells designed to obscure the syringe and needle or to alter the appearance of the syringe.

WO/2014/008601 discloses a hydraulically actuated capsule for use with a dental syringe. The capsule has a cover that can reciprocally cover, uncover and re-cover the syringe needle. A piston is urged upward in a cylinder to release a latching mechanism on the cover. As the cover is biased towards the uncovered position, once the latching mechanism is released, the cover will automatically slide proximally. After use, the user slides the cover distally and then removes the capsule. A dental syringe with the capsule is also provided. The capsule and dental syringe are patient friendly as the patient does not see the needle. However, this is a complex system and is not reusable.

United States Patent Application 20090171298 discloses a syringe for use with a carpule and needle that comprises: (i) a holder for accepting the carpule, the holder comprising at least two linearly disposed first mating members; (ii) a plunger for engagement with the holder; and (iii) a shell for slidably housing the holder, the shell having a distal aperture and a proximal aperture, with a bore therebetween, the shell comprising at least one integral biased member proximate to the proximal aperture, the biased member having a second mating member proximate to a distal end, for mating with the first mating member, such that in a first position, the needle is housed within the shell and in a second position, the needle extends at least partially from the shell. The shell is to obscure the needle and to protect a user from needle sticks. This is a complex design and is not reusable.

United States Patent 5,197,875 discloses dental syringe covers. In one form the syringe cover is of a soft, rubbery material at least at its tip, the tip being formed into a one-way valve by a duckbill construction so that fluid cannot enter from outside. In all embodiments the syringe cover, tapered in shape, fits tightly over the metal dental syringe so that no liquid from the syringe can flow backward over the surface of the syringe. Another feature is a longitudinal gap between the syringe tip and the tip of the syringe cover. The gap functions to isolate the syringe tip from the exterior environment as well as to improve the stream of air, water or air/water mix delivered from the syringe. Preferably the syringe covers include an enlarged generally bell-shaped feature at the end opposite the tip, providing a surrounding cover or sheath for a nut or other fastener typically present at the base end of the metal syringe. This enlarged end surrounds the nut but generally makes little contact with the nut, and in some embodiments provides a handle for gripping the syringe cover to install it over the syringe. The syringe covers of the invention are inexpensive and preferably disposable, but may be sterilizable. This cover is for a syringe that is used for flushing out the mouth of a patient and is therefore designed to extend beyond the syringe and to deliver the fluid, which is usually water, to the patient's mouth, without the syringe making contact with the patient. This therefore would not be suitable for use with a syringe for delivering a medicament to a patient's mouth.

United States Patent 7,037,110 discloses a protective barrier that can be removably fitted over a dental instrument to protect against the transfer of contaminants from one dental patient to another via the dental instrument. The protective barrier, when in use will generally replicate the ergonomic features found on the outer surface of the dental instrument. The barrier is constructed from two mating half portions that include interior chambers and are adapted for placement over and in proximate contact with at least a portion of the outer surface of a dental instrument. The interior chambers of each half portion uniquely contain a yieldably deformable cushion-like elastomer such as polyurethane foam. This barrier is for a reusable device to prevent the device from making contact with the patient. It is not suited for fitting on a syringe and does not have a slot for viewing the carpule. This barrier, therefore, would not be suitable for use with a syringe for delivering a medicament to a patient's mouth. It is also a complex design.

United States Patent 5,921,776 discloses an inexpensive, time-efficient, and effective protective barrier device which provides protection against the transfer of contaminants such as infectious agents from one dental patient to another dental patient is provided. In particular, a barrier device is provided for attachment to a dental instrument. Dental instruments which can be directly protected include saliva

ejector instruments and air/water supply instruments. Because the hands of the dental care provider or other user are protected from exposure to contaminating infectious agents, all dental instruments and accessories are indirectly protected. The barrier device includes a disposable sheath which can be positioned to shroud the instrument without encumbering its functionality. The device further includes a disposable probe which is integrally formed with the sheath and which is attached to the instrument along with the sheath. The disposable sheath is essentially a bag that opens towards the practitioner. It is not formed to the shape of a specific instrument.

United States Patent 4,907,968 discloses a dental syringe covering, shield or prophylactic comprised of a thin, tear-resistant, but deformable material which is sterile and disposable for covering the exposed nozzle surfaces of different types of dental syringes providing a covering which will significantly reduce and/or prevent the spread of diseases which may be transmitted by or through contact with human body fluids and tissues during dental procedures. This covering is not designed for a medicament containing syringe with a needle, but rather for a reusable syringe for rinsing a patient's mouth.

United States Patent Application 20140349244 discloses a sleeve that includes a hollow tube configured to slide on, or attach to, a syringe. The sleeve may also include a plurality of lighting devices located near a distal end of the hollow tube. The plurality of lighting devices may be configured to illuminate when the sleeve is activated. This is to assist the dentist in seeing what they are working on. The sleeve is complex and is not autoclavable.

What is needed is a simple shroud for a dental syringe that is autoclavable and reusable. It should be easy to insert and remove the syringe. It would be advantageous if it were made of a flexible material and design so as to be hingeless. It would be of further benefit if the shroud made the syringe warm to the touch and both more patient friendly in appearance and in sound damping. Additionally, it would be advantageous to provide a compliant surface in the event of a patient biting or clamping their jaws.

Summary:

The present technology is a shroud for a dental syringe. It has sufficient flexibility through the materials used and the design to allow for it to be hingeless. The syringe can be easily inserted into and removed from the shroud. The shroud can be in many different colours and is less clinical looking than a syringe, thereby making the syringe more patient friendly. Further, the silicone material provides some sound damping, which reduces the metallic sounds reaching the patient's ears. Still further, the shroud is warmer to the touch than is metal. An additional benefit is that it provides a compliant surface in the

event of a patient biting or clamping their jaws. The shroud includes at least one slot for viewing of the carpule. This allows a practitioner to check for blood in the carpule, to ensure that the anesthetic solution is not deposited into a blood vessel.

In one embodiment, a combination for use in dentistry is provided, the combination comprising a syringe and a single unit, hingeless shroud, the syringe including a housing with an opening for accepting a carpule, a finger grip, a plunger with a thumb ring proximally, and a hub, the hingeless shroud comprising a pliable wall defining a bore therethrough terminating in a distal aperture and a proximal aperture, a front slot aligned with the front opening, optionally, a back slot aligned with the front opening, a distal curve shaped to accept the hub, a waist and flared section to accept the housing, a shoulder and a proximally located collar shaped to accept the finger grip and a proximal slit extending between and continuous with the front slot and the proximal aperture.

In the combination, the wall may include the back slot.

In the combination, the wall may be silicone.

In the combination, an inner surface of the distal curve, the waist and the flared section is substantially a mirror image of the housing.

In the combination, an inner surface of the shoulder and collar is substantially a mirror image of the finger grip.

In the combination, the shoulder may have a substantially larger diameter than the waist.

In the combination, the wall may have a Shore A durometer rating of about 45.

In the combination, the thumb ring may comprise a plastic polymeric material.

The combination may further comprise a distal slit extending between and continuous with the front slot and distal aperture.

In the combination, the wall of the shroud may thicken from about 1.7 mm thick at the waist to about 7.25 mm thick at the shoulder.

In another embodiment, a hingeless shroud for use with a dental syringe is provided, the shroud comprising a compliant wall defining a bore therethrough terminating in a distal aperture and a proximal aperture, a front slot, optionally, a back slot, a distal curve, a waist, a flared section, a shoulder,

a proximally located collar, and a proximal slit extending between and continuous with the front slot and the proximal aperture.

In the shroud, the wall may have a Shore durometer rating of about 45.

In the shroud, the shoulder may have a substantially larger diameter than the waist.

In the shroud, the wall may be between about 1.7 mm thick to about 7.25 mm thick.

In the shroud, the wall may thicken from about 1.7 mm thick at the waist to about 7.25 mm thick at the shoulder.

The shroud may further comprise a distal slit extending between and continuous with the front slot and the distal aperture.

In the shroud, the wall may be silicone.

In another embodiment, a method of covering a hub, a finger grip and a housing of a dental syringe with the hingeless shroud is provided, the method comprising inserting the hub into the distal curve, opening the proximal slit, locating the housing in the waist and flared section, locating the finger grip in the shoulder and collar, and optionally adjusting placement of the front slot to align with an opening of the syringe.

In the method, the wall of the shroud may have a Shore A durometer rating of about 45.

In the method, the wall may comprise silicone.

In the method, the shoulder may have a substantially larger diameter than the waist.

In the method, the wall may be between about 1.7 mm thick to about 7.25 mm thick.

In the method, the shroud may further comprise a distal slit extending between and continuous with the front slot and the distal aperture.

In the method, the wall is about 7.25 mm thick at the shoulder.

Figures:

Figure 1 is a side view of the combination of the present technology.

Figure 2A is a longitudinal section through the shroud of the present technology; Figure 2B is a cross section through the shroud of the present technology at line 2B; Figure 2C is a cross section through the shroud of the present technology at line 2C.

Figure 3 is a longitudinal sectional view of the combination of the present technology.

Figure 4 is a plan view of the shroud of the present technology.

Description:

Dental syringes differ from medical syringes in that the medicament is contained in and released from carpules. A dental syringe includes a housing with an opening designed to receive a medicament filled carpule. A shaft is moveably disposed in the housing and engages with one end of the carpule. Before the medicament is dispensed the practitioner checks for blood in the carpule after pulling back slightly on the plunger. This is to ensure that the anesthetic solution will not be deposited in a blood vessel. As pressure is applied to the shaft, the medicament is dispensed through a needle.

A combination of a shroud and dental syringe, generally referred to as 10, is shown in Figure 1. A shroud, generally referred to as 12, covers much of a syringe, generally referred to as 14, which may be a type A dental syringe. The syringe 14 is shown with a needle 16 extending from and releasably attached to the housing 18 of the syringe 14. A carpule 20 is loaded in an opening 22 in the housing 18. Extending proximally is a plunger 24 with a proximally located thumb ring 26. The thumb ring 26 is made of a plastic polymeric material and can be provided in many different colours. The shroud 12 is specifically shaped to accept the syringe 14. The shroud 12 has a wall 30 with a front slot 32 that is aligned with the opening 22 and is the same shape as the opening 22. A proximal slit 34 extends from and is continuous with the front slot 32. It terminates at the proximal end 36. In one embodiment, a distal slit 38 extends from and is continuous with the front slot 32. It terminates at the distal end 40. The slits 34, 38 allow the shroud 12 to be opened up to receive the syringe 14 as they extend through the entire depth 31 of the wall 30 (See Figure 2B).

The shroud 12 is a single unit and is preferably molded from silicone. The durometer rating of the shroud 12 is preferably about a Shore A 45 plus or minus 5 rating in order for the shroud 12 to be pliable enough for loading the syringe 14 into it. It is preferably a High Consistency Silicone Rubber (HCR) or Liquid Silicone Rubber (LSR).

As shown in Figures 2A, 2B, and 2C the shroud has a proximal aperture 42 and a distal aperture 44 with a bore 46 therebetween. The proximal slit 34 and the distal slit 38 are continuous with the respective apertures 42, 44 and the bore 46. The shroud wall 30 is shaped to accept the syringe 14. It has a lip 48, a distal curve 50, a waist 52, a flared section 54, a shoulder 56, a proximally located collar 58 and a grip 60. The distal curve 50, waist 52 and flared section 54 are collectively referred to as the body 53. The proximal slit 34 is located in the shoulder 56, collar 58 and grip 60. The distal slit 38 is located in the distal curve 50 and lip 48. In an alternative embodiment, the distal slit 38 is continuous with the back slot (see Figure 4 for the back slot) and the distal aperture 44. In the preferred embodiment, there is no distal slit.

As shown in Figure 3, the shoulder 56, collar 58 and grip 60 are shaped to fit over the finger grip 70 of the syringe 14. Comparing Figure 3 and Figure 2A, an inner surface 72 of the shoulder 56, collar 58 and grip 60 is substantially a mirror image of the finger grip 70. An inner surface 74 of the flared section 54, the waist 52 and the distal curve 50 is substantially a mirror image of the syringe housing 18 and is therefore linear, except at the distal end 76 of the syringe, where the lip 48 is shaped to fit a minimal amount over the syringe distal end 76, defining the distal aperture, which is sized to allow the hub 78 to extend through to the ambient environment. The wall 30 is about 1.7 mm thick over much of the length, expanding to about 2.9 mm thick at the distal curve 50 and to about 7.25 mm thick at the shoulder 56.

Without being bound to theory, the combination of the durometer rating of the material and the thickness provides sufficient elasticity to permit flexing of the shroud during insertion and removal of the syringe without the need for a hinge, while providing sufficient support to be freestanding. The change in thickness of the wall 30 provides an ergonomic shape for the user's hand, in addition to providing some cushioning, both which reduce user fatigue. The material chosen is warm to the touch.

As shown in Figure 4, a back slot 80 is aligned with the front slot 32, but is smaller. As can be understood, it aligns with the opening 22 in the housing 18 of the syringe distally.

To use the shroud 12, the practitioner grasps the shroud 12 in one hand and the syringe 14 in the other. The syringe 14 is slid into the bore 46, hub 78 first, until the hub 78 protrudes through the distal aperture 44. The proximal slit 34 and the distal slit 38 are continuous with the respective apertures 42, 44. The front slot 32 is aligned with the opening 22 in the housing 18, the proximal slit 34 is then opened by separating a first edge 100 from a second edge 102 and the shoulder 56, collar 58, and grip

60 are wrapped around the finger grip 70. The needle 16 is then attached to the syringe 14. After use, the needle 16 is preferably removed. The proximal slit 34 is opened and the shoulder 56, collar 58, and grip 60 are unwrapped from the finger grip 70, and the syringe 14 is extracted through both the front slot 32 and the opening provided by the proximal slit 34. The shroud 12 can then be autoclaved and reused.

While example embodiments have been described in connection with what is presently considered to be an example of a possible most practical and/or suitable embodiment, it is to be understood that the descriptions are not to be limited to the disclosed embodiments, but on the contrary, is intended to cover various modifications and equivalent arrangements included within the spirit and scope of the example embodiment. Those skilled in the art will recognize, or be able to ascertain using no more than routine experimentation, many equivalents to the specific example embodiments specifically described herein. Such equivalents are intended to be encompassed in the scope of the claims, if appended hereto or subsequently filed.

Claims:

[Claim 1] A combination for use in dentistry, the combination comprising a syringe and a single unit, hingeless shroud, the syringe including a housing with an opening for accepting a carpule, a finger grip, a plunger with a thumb ring proximally, and a hub, the hingeless shroud comprising a pliable wall defining a bore therethrough terminating in a distal aperture and a proximal aperture, the wall including: a front slot aligned with the front opening; a body terminating in a lip distally that defines the distal aperture through which the hub extends to an ambient environment, the body covering the housing; a shoulder proximal to the body; a grip proximal to the shoulder; a collar defining the proximal aperture through which the plunger extends into the ambient environment, the shoulder, grip and collar covering the finger grip; and a proximal slit extending between and continuous with the front slot and the proximal aperture.

[Claim 2] The combination of claim 1, wherein the body includes a distal curve proximal to the lip, a waist proximal to the distal curve and a flared section proximal to the waist.

[Claim 3] The combination of claim 2, wherein an inner surface of the distal curve, the waist and the flared section is substantially a mirror image of the housing.

[Claim 4] The combination of claim 2 or 3, wherein an inner surface of the shoulder, the grip and the collar is substantially a mirror image of the finger grip.

[Claim 5] The combination of any one of claims 2 to 4, wherein the shoulder has a substantially larger diameter than the waist.

[Claim 6] The combination of any one of claims 2 to 5, wherein the wall thickens from about 1.7 mm thick at the waist to about 7.25 mm thick at the shoulder.

[Claim 7] The combination of any one of claims 1 to 6, wherein the wall is silicone.

[Claim 8] The combination of any one of claims 1 to 7, wherein the wall has a Shore A durometer rating of about 45.

[Claim 9] The combination of any one of claims 1 to 8, wherein the thumb ring comprises a plastic polymeric material.

[Claim 10] The combination of any one of claims 1 to 9, further comprising a distal slit extending between and continuous with the front slot and the distal aperture.

[Claim 11] The combination of any one of claims 1 to 10, wherein the wall includes a back slot.

[Claim 12] A hingeless shroud for use with a dental syringe, the shroud comprising a compliant wall defining a bore therethrough terminating in a distal aperture and a proximal aperture, the wall including: a body terminating in a lip distally that defines the distal aperture; a front slot in the body; a shoulder proximal to the body; a grip proximal to the shoulder; a collar defining the proximal aperture; and a proximal slit extending between and continuous with the front slot and the proximal aperture.

[Claim 13] The shroud of claim 12 wherein the wall has a Shore durometer rating of about 45.

[Claim 14] The shroud of claim 12 or 13, wherein the wall is between about 1.7 mm thick to about 7.25 mm thick.

[Claim 15] The shroud of any one of claims 12 to 14, wherein the wall is silicone.

[Claim 16] The shroud of any one of claims 12 to 15, further comprising a distal slit extending between and continuous with the front slot and the distal aperture.

[Claim 17] The shroud of any one of claims 12 to 16, wherein the body includes a distal curve proximal to the lip, a waist proximal to the distal curve and a flared section proximal to the waist.

[Claim 18] The shroud of claim 17, wherein the shoulder has a substantially larger diameter than the waist.

[Claim 19] The shroud of claim 17 or 18, wherein the wall thickens from about 1.7 mm thick at the waist to about 7.25 mm thick at the shoulder.

[Claim 20] A method of covering a dental syringe with the hingeless shroud of claim 12, the syringe comprising a hub distally, a housing proximal to the hub, the housing defining an opening, a finger grip proximal to the housing and a plunger slidably housed within the housing and extending proximally to a thumb ring, the method comprising: inserting the syringe into the body through the front slot such that the hub extends through the distal aperture, opening the proximal slit, locating the housing in the body, locating the finger grip in the shoulder, grip and collar, and adjusting placement of the front slot to align with the opening of the syringe.

[Claim 21] The method of claim 20, wherein the wall of the shroud has a Shore A durometer rating of about 45.

[Claim 22] The method of claim 21, wherein the wall comprises silicone.

[Claim 23] The method of any one of claims 20 to 22, wherein locating is further defined as wrapping the wall around the syringe.

[Claim 24] The method of any one of claims 20 to 23, further comprising uncovering the dental syringe by opening the proximal slot, and extracting the syringe from the shroud through the proximal slot there opened and the front slot.

[Claim 25] The method of claim 24, further comprising autoclaving the shroud.

[Claim 26] The method of claim 25, further comprising covering a second or a subsequent dental syringe with the autoclaved shroud.

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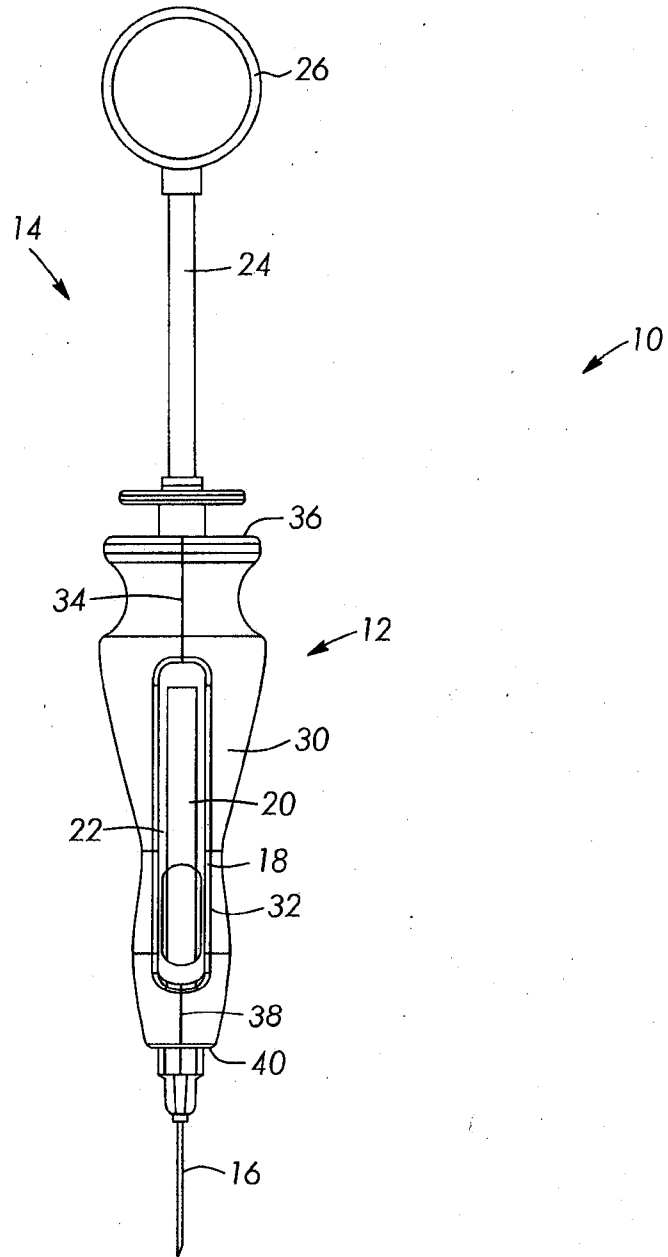


FIG. 1

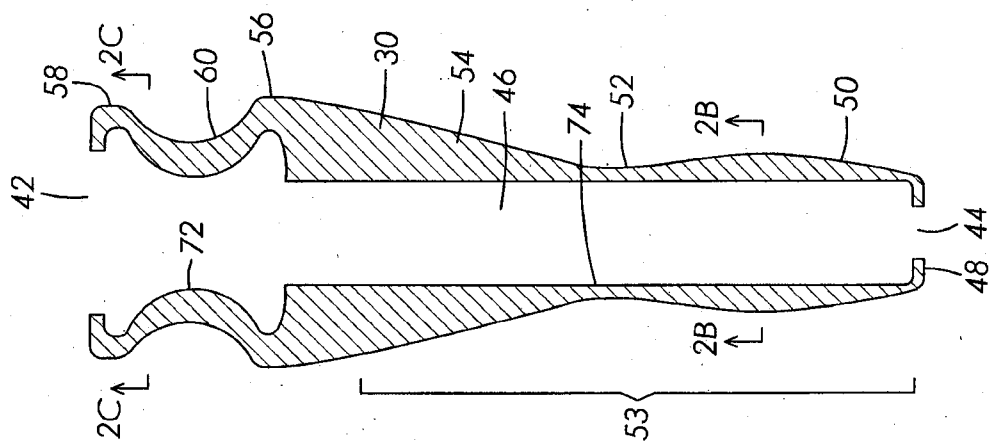


FIG. 2A

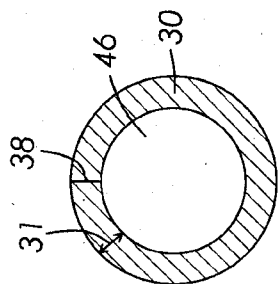


FIG. 2C

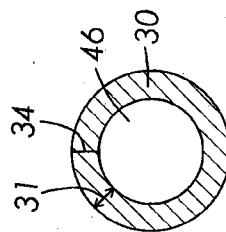


FIG. 2B

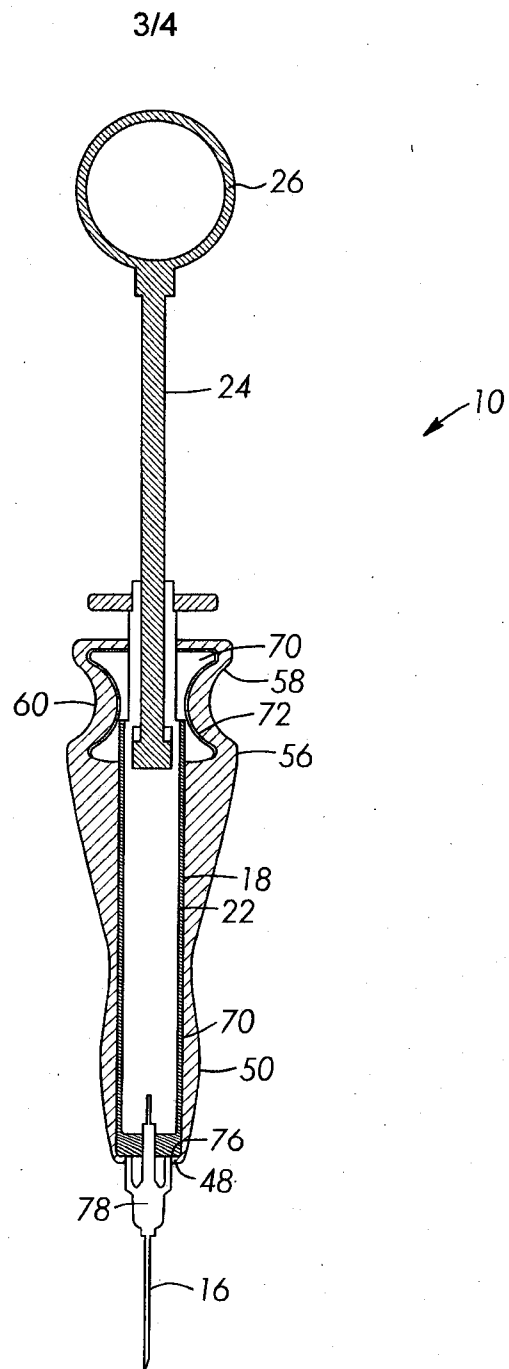


FIG. 3

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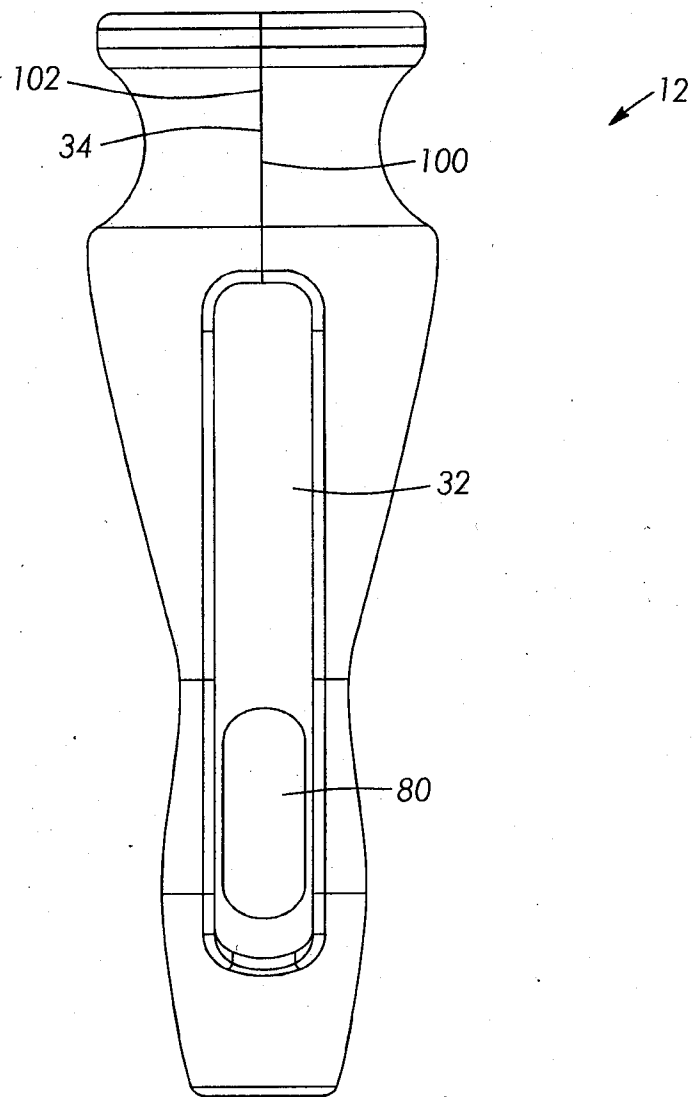


FIG. 4

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CA2016/000190

A. CLASSIFICATION OF SUBJECT MATTER

IPC: *A61M 5/31* (2006.01), *A61M 5/178* (2006.01), *A61M 5/28* (2006.01), *A61M 5/32* (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)

IPC (2016.01): A61M 5/*

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

Electronic database(s) consulted during the international search (name of database(s) and, where practicable, search terms used)

Questel Orbit; Intellect (Canadian Patent Database)

Keywords: syringe or carpule; sleeve or shell or shroud; autoclav+; silicone; dent+

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	CA2724848A1 (MUDD et al.) 30 December 2009 (30-12-2009) *Figs. 2A, 2B; paragraphs 0035, 0043, 0044*	1-26
A	US2009137966A1 (RUECKERT et al.) 28 May 2009 (28-05-2009) *full document*	1-26
A	CA2875193A1 (BRYANT et al.) 05 December 2013 (05-12-2013) *full document*	1
A	CA2646682A1 (MAGNE) 13 June 2009 (13-06-2009) *full document*	1
A	US4713060A (RIULI) 15 December 1987 (15-12-1987) *full document*	1

☒ Further documents are listed in the continuation of Box C.☒ See patent family annex.

* "A" "E" "L" "O" "P"	Special categories of cited documents: document defining the general state of the art which is not considered to be of particular relevance earlier application or patent but published on or after the international filing date 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) document referring to an oral disclosure, use, exhibition or other means document published prior to the international filing date but later than the priority date claimed	"T" "X" "Y" "&"	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 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 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
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Date of the actual completion of the international search

14 September 2016 (14-09-2016)

Date of mailing of the international search report

22 September 2016 (22-09-2016)

Name and mailing address of the ISA/CA
Canadian Intellectual Property Office
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50 Victoria Street
Gatineau, Quebec K1A 0C9
Facsimile No.: 819-953-2476

Authorized officer

Zoran Novakovic (819) 639-7880

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CA2016/000190

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	CA2845888A1 (EKMAN et al.) 21 March 2013 (21-03-2013) *full document*	1
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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CA2016/000190

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